

Weapons Activities

Department of Energy
FY 1998 Budget Request to Congress
(discretionary dollars in thousands)

	FY 1996 Current Appropriation	FY 1996 Comparable Appropriation	FY 1997 Current Appropriation	FY 1997 Comparable Appropriation	FY 1998 Request
Weapons Activities					
Stockpile stewardship - DP	1,542,418	1,375,407	1,656,767	1,436,530	1,444,290
Stewardship - Marshall Island/dose reconstruction	6,800	—	—	—	—
Stockpile management - DP	1,998,652	1,727,646	1,928,831	1,834,470	1,828,465
Stockpile Management - Dose Reconstruction	2,888	—	—	—	—
Program direction - DP	113,774	324,873	325,600	325,600	303,500
Defense Nuclear Facilities Safety Board Rep	1,000	—	—	—	—
Subtotal, Weapons activities	3,665,532	3,427,926	3,911,198	3,596,600	3,576,255
Use of prior year balances	-210,764	-210,764	—	—	—
Total, Weapons Activities	3,454,768	3,217,162	3,911,198	3,596,600	3,576,255
Defense Assets Acquisition					
Stockpile stewardship	—	119,905	—	220,237	1,049,426
Stockpile management	—	113,625	—	94,361	452,969
Total, Defense Assets Acquisition	—	233,530	—	314,598	1,502,395

**DEPARTMENT OF ENERGY
FY 1998 CONGRESSIONAL BUDGET REQUEST
ATOMIC ENERGY DEFENSE ACTIVITIES
WEAPONS ACTIVITIES**

PROPOSED APPROPRIATION LANGUAGE

For Department of Energy expenses, including the [purchase, construction and] acquisition of [plant and] capital equipment and other incidental expenses necessary for atomic energy defense weapons activities in carrying out the purposes of the Department of Energy Organization Act (42 U.S.C. 7101, et seq.) [including the acquisition or condemnation of any real property or any facility or for plant or facility acquisition, construction, or expansion:] and the purchase of passenger motor vehicles (not to exceed [94] 70, for replacement only), [\$3,911,198,000, to remain] \$3,576,255,000, to become available on October 1, 1997 and \$3,497,000,000 to become available on October 1, 1998, all of which shall remain available until expended.

EXPLANATION OF CHANGE

Changes in appropriation language relate to the number of vehicles to be acquired; to the request for two years of appropriations; and to the establishment of a separate Defense Assets Acquisition appropriation which will contain all requested construction funding.

DEPARTMENT OF ENERGY
FY 1998/1999 CONGRESSIONAL BUDGET REQUEST
DEFENSE PROGRAMS
(Tabular dollars in thousands; Narrative in whole dollars)

WEAPONS ACTIVITIES
EXECUTIVE BUDGET SUMMARY

VISION High confidence in the safety, security, reliability and performance of the Nation's enduring nuclear weapon stockpile within the constraints of a comprehensive test ban, utilizing a science-based approach to stockpile stewardship within a smaller, more efficient and cost effective weapons complex infrastructure.

MISSION The mission of the Stockpile Stewardship and Management Program is:

- to maintain indefinitely the safety, reliability and performance of the current nuclear weapons stockpile without nuclear testing;
- to maintain the capability to return to the design and production of new weapons and to underground nuclear testing, if so directed by the President; and,
- to dismantle safely excess weapons, and dispose of or store excess components.

STRATEGY Rely on scientific understanding and expert judgement, rather than on nuclear testing and the development of new weapons, to predict, identify and correct problems affecting the safety, reliability or performance of the enduring stockpile. View the stockpile life cycle as essentially a "closed loop" and aggressively search every weapon for defects, assess whether any defects found will affect weapon safety, reliability or performance, and replace defective parts as necessary. Develop enhanced experimental capabilities and new tools in computations, surveillance, and advanced manufacturing to support this approach. Retire and dismantle weapons as needed to meet arms control objectives. As new tools are developed and validated, incorporate them into a smaller, environmentally-sound, more flexible and agile weapons complex infrastructure for the future.

POLICY FRAMEWORK

Over the past several years, the United States policy governing the nuclear weapons stockpile has undergone profound change to reflect the new and evolving geopolitical and military structures of the post Cold War world. In 1992, the United States announced a halt in the production and design of new nuclear weapons and a moratorium on underground nuclear testing. In 1993 and 1994, the President and the Congress directed the Secretary of Energy to establish a stockpile stewardship program to ensure the preservation of the core intellectual and technical competencies of the United States in nuclear weapons.

In September, 1994, the President approved the Nuclear Posture Review, which established requirements for the Department of Energy related to maintaining nuclear weapons infrastructure and capabilities, and ensuring tritium availability. The requirements for DOE were stated in terms of "infrastructure to support U.S. nuclear forces," delineated specifically as follows: maintain nuclear weapon capability (without underground nuclear testing); develop a stockpile surveillance engineering base; demonstrate the capability to design, fabricate and certify weapon types in the enduring stockpile; maintain the capability to design, fabricate, and certify new warheads; and ensure tritium availability. No production of new-design nuclear warheads is required.

In August 1995, the President announced that the United States would pursue a zero yield Comprehensive Test Ban Treaty (CTBT) as a means of reducing the danger posed by nuclear weapons proliferation. One of the six safeguards that defines the United States' participation in the CTBT is the conduct of a stockpile stewardship program to ensure the safety and reliability of the weapons remaining in the nation's nuclear stockpile. In addition, the President requested a new annual certification process to certify that the stockpile is safe and

Weapons Activities - EXECUTIVE BUDGET SUMMARY

reliable in the absence of underground nuclear testing, and to produce a statement about future confidence in the safety and reliability of the stockpile. In September, 1996, the United Nations General Assembly voted nearly unanimously to endorse the CTBT negotiated at the Geneva-based Conference on Disarmament. President Clinton signed the treaty on September 24, 1996..

In January, 1996, the Senate gave overwhelming approval to the START II Treaty; however, the Russian Duma has not ratified START II. The U.S. Senate's treaty ratification text highlighted the Nation's commitment to proceed with a robust stockpile stewardship program, to reestablish and maintain sufficient production capabilities and capacities, to maintain the U.S. nuclear weapons laboratories and the core competencies therein, to ensure rapid access to a new production source for tritium within the next decade, and to maintain the Nevada Test Site at a level which would enable timely resumption of underground nuclear testing if directed by the President.

On March 11, 1996, the President signed the implementing Presidential Decision Directive (PDD) for the Fiscal Year 1996-2001 Nuclear Weapons Stockpile Memorandum. This PDD is the first to present two force structure options (START I and START II). The President has declared United States nuclear forces will maintain flexibility to both "hedge" against foreign political reversals (START I) as well as to "lead" through further reductions (START II). This strategy has been recognized in developing the programs and associated budget to meet these goals. This strategy is also supported in the Department's plans to transition the nuclear weapons complex from capacity-based to capability-based, while providing flexibility to support changing stockpile sizes. The PDD also details the dual-track approach for a new tritium source.

In April, 1996, the Secretary of Energy submitted to the Congress the first Stockpile Stewardship and Management Plan. The Plan is a roadmap of program activities needed to accomplish stockpile stewardship and management program goals. The document will be updated annually, and is a major integrated program planning document for the program.

The Department has recently completed work on the Stockpile Stewardship and Management Programmatic Environmental Impact Statement (SSM/PEIS). On December 19, 1996, the Secretary of Energy signed the Record of Decision, enabling the DOE to proceed to construction on several key new experimental facilities, reestablish a limited pit manufacturing capability, and begin facility downsizing in FY 1998 where needed in accordance with anticipated future workload levels..

PROGRAM OVERVIEW

The Defense Programs Stockpile Stewardship and Management Program is a single, highly integrated technical program for maintaining the safety and reliability of the U. S. nuclear stockpile that has evolved in response to these many new policies. Traditionally, the activities of the three weapons laboratories and the Nevada Test Site have been regarded somewhat separately from those of the weapon production plants. However, although they remain separate budget decision units within Weapons Activities, all stockpile stewardship and management activities have achieved a new, closer linkage to each other as described in the annual Stockpile Stewardship and Management Plan and SSM/PEIS.

There are three primary goals of the Stockpile Stewardship and Management Program:

- Provide high confidence in the safety, security, reliability and performance of the enduring U. S. stockpile to ensure the effectiveness of the U.S. nuclear deterrent while simultaneously supporting U. S. arms control and nonproliferation policies,
- Provide an appropriately sized, affordable, environmentally sound, and effective production complex to provide component and weapon replacements when needed, including limited lifetime components and tritium, and
- Provide the ability to resume U.S. nuclear testing and reconstitute nuclear weapon production capacities, consistent with Presidential Directives, the Nuclear Posture Review, and the START II Treaty, should national security so demand in the future.

Weapons Activities - EXECUTIVE BUDGET SUMMARY

The Stockpile Stewardship program addresses issues of maintaining confidence in stockpile safety and reliability without nuclear testing through a technically challenging science-based stockpile stewardship program utilizing upgraded or new experimental, computational and simulation capabilities. The Stewardship programs are planned to meet the infrastructure requirements contained in the Nuclear Posture Review. The Stewardship programs continue with major initiatives in high energy density research with lasers and accelerated research and development in advanced computations to acquire and use data to improve predictive capabilities which will be the foundation of the science-based stewardship approach. Major new experimental facilities are planned to expand and enhance the scientific and engineering base for stockpile stewardship, and to assure that DP can continue to attract and retain the high quality scientific and technical personnel needed to make the scientific and technical judgements related to the safety and reliability of the stockpile in the absence of nuclear testing.

The Stockpile Management program continues with its historical responsibilities to provide near term and long range support for the enduring stockpile, and for ensuring an adequate supply of tritium. Along with stockpile surveillance, this includes normal maintenance, corrective maintenance and system refurbishment, as well as weapon dismantlement. The Stockpile Management programs continue initiatives in enhanced surveillance and advanced manufacturing, and with the completion of the Stockpile Stewardship and Management Programmatic Environmental Impact Statement (PEIS), will initiate Stockpile Management Restructuring Initiative projects to downsize and modernize production capabilities needed for the future. The programs are supportive of the infrastructure requirements cited in the Nuclear Posture Review. The DOE also has completed a PEIS for tritium production, and has pursued a dual-track approach to research, development and engineering needed to enable a decision in 1998 to select a primary and backup production method.

In the new paradigm of closer integration between Stockpile Stewardship and Management activities, there are also issues that will be addressed jointly. The Stewardship program will play a major role in reducing the vulnerability of the smaller stockpile to single-point and common-mode failures, principally through research base support of the new Enhanced Surveillance initiative funded in the Stockpile Management decision unit. The Stewardship and Management programs also have shared responsibilities in advanced manufacturing and systems engineering studies to integrate technological drivers such as advanced computing into an efficient and effective production complex of the future. The Dual Revalidation program, managed by Stockpile Management, will encompass both laboratories and plants in a new joint process for validating the safety, reliability and performance of the stockpile over time. Finally, the Radiological/Nuclear Accident Response program, funded by Stockpile Management, utilizes capabilities throughout the weapons complex, including weapons expertise at the laboratories and specialized capabilities resident at the DOE facilities in Nevada.

TABLE 1
Account Summary
(Budget Authority in Thousands)

DEFENSE PROGRAMS	FY 1996 Appropriation	FY 1997 Appropriation	FY 1998 Budget Request	FY 1999 Budget Request
Weapons Activities (O&M and Construction)	3,665,532¹	3,911,198	--	--
Weapons Activities Operations and Maintenance	--	--	3,576,255	3,497,000
Defense Asset Acquisition	--	--	1,502,395	668,000
<i>Adjustments/Use of Prior Year Balances</i>	(210,764)	--	--	--
Total Defense Programs BA (non-comparable)	3,454,768	3,911,198	5,078,650	4,165,000

Beginning in FY 1998, Defense Programs will be funded from two appropriation accounts: Weapons Activities Operations and Maintenance and the Defense Asset Acquisition accounts, as summarized in Table 1. This change is consistent with the Administration's creation of Defense Asset Acquisition accounts across DOE to improve Department-wide planning and decision making for asset acquisition. The accounts are consolidated by appropriation, and as such this approach mitigates the wide annual fluctuations in individual programs' construction funding profiles caused when a program funds a large acquisition in a single year. This new account provides obligational authority for expenditures on all current year construction projects, as well as provides "up front" budget authority for new projects. In FY 1998, the transition year, budget authority is requested to complete all ongoing projects begun in prior years. The transition to up front budget authority does not affect the annual obligations profile or anticipated outlays; it is a mechanism by which the government can make decisions on asset acquisition based upon estimates of costs for total projects or major phases of projects, rather than funding major acquisitions incrementally on an annual basis. Non-comparable funding estimates are contained at the appropriation level on this table and at the Base Table level on the Program Funding Summaries in each decision unit. Funding schedules and funding estimates referenced in the narrative are comparable to the FY 1998 structure. Discussion of construction projects included in the Defense Programs' portion of the Defense Asset Acquisition account is contained in Construction Project Data Sheets which are located at the end of each Weapons Activities decision unit.

¹ Includes \$37.2 million in Streamlining Savings directed by FY 1996 Energy and Water Development Appropriations Act, and adjustment for FY1996 Rescission related to federal support costs (Stockpile Stewardship \$0.677 million, Stockpile Management \$4.643 million, and Program Direction \$0.226 million)

TABLE 2
Program Summary
(Budget Authority in Thousands)

DEFENSE PROGRAMS	FY 1996 Appropriation	FY 1996 Comparable	FY 1997 Comparable	FY 1998 Budget Request	FY 1999 Budget Request
Stockpile Stewardship	1,549,218	1,375,407	1,436,530	1,444,290	1,409,000
Stockpile Management	2,001,540	1,727,646	1,834,470	1,828,465	1,788,000
Program Direction	114,774	324,873	325,600	303,500	300,000
Subtotal	3,665,532	3,427,926	3,596,600	3,576,255	3,497,000
Defense Acquisition Account	n/a	233,530	314,598	1,502,395	668,000
<i>Adjustments, Use of Prior Year Balances</i>	(210,764)	(210,764)	--	--	--
Total, Defense Programs Budget Authority	3,454,768	3,450,692²	3,911,198	5,078,650	4,165,000
<i>BA for transition to Full Funding³</i>	n/a	n/a	n/a	[1,034,200]	n/a
<i>Federal Staff (FTE's)</i>	2,069	2,069	2,022	1,925	TBD

The funding for Weapons Activities decision units shown in Table 2 reflects the FY 1996 appropriation as enacted, and FY 1996 through FY 1999 figures comparable to the FY 1998 account structure. Construction is discussed in the Defense Programs section of the Defense Asset Acquisition account, included in each decision unit. More detailed information on the decision unit totals is contained in Table 4 at the end of this summary.

The FY 1998 request for budget authority for Defense Programs is increased by 29.8 percent over FY 1997 appropriations, mostly attributable to the inclusion of additional budget authority for future year obligations. The FY 1998 request for Weapons Activities is \$3.58 billion, a decrease of less than 1 percent from the comparable FY 1997 Congressional appropriations. The funding level is responsive to guidance contained in the Stockpile Stewardship and Management Plan, and is necessary to support the new initiatives we have undertaken for Stockpile Stewardship and in support of the Stockpile Stewardship and Management Programmatic Environmental Impact Statement. Within the reduced request for Weapons Activities Operations and Maintenance, we have continued growth in three major initiatives: Enhanced Surveillance, in the Stockpile Management account, + \$5 million;

² Includes transfers of \$157.381 million from Stockpile Management to Program Direction and \$47.106 from Stockpile Stewardship to Program Direction related to the establishment of a single Federal program direction account; a transfer from Program Direction to Departmental Administration of \$6.612 million for the Working Capital Fund; and transfers to Defense Programs from the Office of Environment, Safety and Health totalling \$10.688 million for Defense Nuclear Facilities Safety Board activities, and Marshall Islands and Dose Reconstruction activities.

³ Starting in FY 1998, the Department is requesting the budget authority required to fully fund construction line items. For Defense Programs, this transition has the effect of increasing our FY 1998 budget request by about \$1.03 billion.. However, this change does not alter our planned obligations level.

Tritium Supply, + \$34.5 million (plus the initiation of two Defense Asset Acquisition construction line items); and the Accelerated Strategic Computing Initiative (+ \$53 million). These increases are offset by a scheduled reduction in the O&M funding of a fourth initiative, the National Ignition Facility, - \$28.9 million., and other reductions in O&M activities.

CHANGES FROM THE FY 1997 REQUEST

The Congress enacted both authorization and appropriations acts for national security programs for FY 1997. Appropriations for Defense Programs in FY 1997 exceeded the President's Request by \$201 million, which permits us to accelerate several important initiatives in Stockpile Stewardship and Management, including the new tritium source and enhancement of the manufacturing infrastructure for the nuclear weapon stockpile.

Tritium Fiscal Year 1997 appropriations for the Tritium program activities exceeded the President's Request by \$50 million. Applying this additional funding to the Accelerator Production of Tritium and the Commercial Light Water Reactors program efforts has allowed us to accelerate several key activities from FY 1998 to FY 1997, and as such improve the quality and quantity of information which will be available for the expected primary technology selection in late 1998. Activities accelerated include: early completion of the radio frequency linac design and earlier turnover to the prime contractor; demonstration of the beam through the radio frequency quadrupole earlier; and, earlier completion of the evaluation of irradiated materials and superconducting cavities. Operations and Maintenance technology development activities have been adjusted accordingly in FY 1998. The Defense Asset Acquisition account also includes \$208 million to fully fund Title I design of an APT and Title I and II of the CLWR Tritium Extraction Facility.

Enhanced Surveillance The Enhanced Surveillance Program (ESP) is an integrated effort among the nuclear weapons laboratories and the production plants to develop modern technologies for detecting degradation and predicting service lives of nuclear weapons and their materials and components. It is a long-term, continually evolving research and development effort with six major focus areas: material characterization and surveillance, materials aging model development, component surveillance and diagnostics, component performance models, enhanced systems testing, and system performance models. ESP is a logical step between the traditional surveillance program and anticipated weapon refurbishment. It will be closely coordinated and integrated with other initiatives such as the Accelerated Strategic Computing Initiative (ASCI) and Advanced Manufacturing Design and Production Technologies (ADaPT). In FY 1997, congressional appropriations were increased \$35 million over the request for enhanced surveillance activities, \$15 million in the Stockpile Management program, and \$20 million in the Stewardship program. The additional funding has been allocated to the production plants and the laboratories and will be used to accelerate planned activities including shelf life data archiving and improving diagnostic techniques at the production plants; at the laboratories, the additional funding supports advanced hydro radiography initiatives and the LANSCE short pulse spallation source upgrade. In the Stockpile Management program, the FY 1998 funding increase of \$5 million over the FY 1997 level will continue with activities accelerated in FY 1997.

National Ignition Facility (NIF) The National Ignition Facility (NIF) is an experimental laser-fusion facility that will simulate, on a small but diagnosable scale, conditions of pressure, temperature and density close to those that occur during the detonation of a nuclear weapon. The facility will be the largest of its kind in the world, capable of providing an output pulse with an energy of 1.8 megajoules and an output pulse power of 500 terawatts at a wavelength of 0.35 micrometers. The conceptual design for the project was completed in 1994, and design activities have been underway since fiscal year 1996. The National Environmental Policy Act process has been completed, and Lawrence Livermore National Laboratory was selected as the site for NIF as part of the December 1996 Record of Decision on the Stockpile Stewardship and Management PEIS. DOE authorization to begin site preparation is expected in March, 1997.

The major achievement for NIF was completion of the Title I design for the project. As a result of design evolution during this process, which optimized the facility for the selected site as well as integrated additional functionality into the design, the total project cost has increased by \$125.3 million, and the completion date is now projected as 3rd quarter FY 2003. As a result of these changes, the NIF will now be constructed in a manner that will make the first bundle of eight lasers available for experimentation two years before project completion. This approach reduces overall project risk due to earlier demonstration of key facility systems, integrates experienced experimental program staff at an earlier stage of the project, and permits limited experimentation to obtain valuable data for Stockpile Stewardship during this time.

Weapons Activities - EXECUTIVE BUDGET SUMMARY

The FY 1998 budget requests \$876.4 million to complete design activities and fully fund physical construction. In FY 1998 the project will initiate the Laser and Target Area Building foundations, framing and structural construction in October, 1998. The other major activities to be accomplished during FY 1998 include completion of the final detailed design (Title II) for both the conventional facilities and the special equipment, continuation of the optics facilitization and optics pilot production activities, and initiation of the Final Safety Analysis Report.

Accelerated Strategic Computing Initiative (ASCI) ASCI development activities, as detailed in the ASCI Program Plan, primarily focus on two areas: advanced applications development and pushing the high end capabilities of computing. The rapid growth of this program, and the momentum it has generated in the laboratories and the high performance computing community at large, has resulted in the program's first major achievement in FY 1997. Sandia National Laboratories and Intel demonstrated a world record of 1 trillion operations per second in an ASCI-sponsored design and development effort. This level of operations in a high performance computer is almost three times faster than the previous supercomputer record holder. The ASCI program will continue to leverage the phenomenal performance gains in microprocessors to achieve memory capacities and speeds thousands of times greater in the future.

In FY 1997, Congressional appropriations for ASCI were increased by \$30 million over the FY 1997 request. This funding will be used to accelerate the program plan by initiating work on at least 3 additional aging codes focussed on critical weapon initiation sequences, expanding joint work with the computer industry to fund large scalable memory capability on Option Red and Option Blue computers, and by increasing alliances with universities. The FY 1998 program growth of \$53.2 million will be used to sustain this momentum by executing activities in the current program plan. In addition to code development activities and pushing the capabilities of computer hardware, FY 1998 activities will also focus on three implementing strategies. Significant effort will be placed on insuring that the ASCI program is a single program integrating the efforts of the three laboratories, the production plants, and industrial and university partners. Effort will be placed on insuring that the problem-solving environment ultimately created by the ASCI program meets the needs of the laboratory scientist users and does so in the most efficient manner possible. Emphasis will be placed on insuring that ASCI will take full advantage of new developments in computing and physical sciences by aggressively engaging in strategic alliances and collaborations with Universities, other government agencies, and industry.

Advanced Manufacturing Design and Production Technology In past years, a large weapons production complex provided the capability and capacity to rapidly produce new weapons and fix problems in the stockpile. While new weapons are not planned, the Department must maintain a reliable, quality production capability to support the weapons stockpile as it ages. To meet that challenge, the complex is entering a period of downsizing to guarantee an affordable and viable production capability for the future. In planning for this activity, it has been recognized by the Department that emerging technologies in agile manufacturing and enterprise integration must be adopted throughout the complex and that opportunities for less costly, smaller footprint and environmentally sound production processes must be pursued. The Congress added funding and direction to initiate these efforts in FY 1997. This funding was allocated to all plants and laboratories and provided for work in enterprise modeling, product realization, model-based design and manufacturing, and the development of a laser-cutting workstation for application to workload needs in the weapons program. Beginning in FY 1997, the program is integrated with existing efforts in Process Development at the production plants, and will be continued at a essentially the same level of effort in FY 1998.

Technology Transfer The Congress provided \$10 million in additional appropriations for Technology Transfer activities in FY 1997, with direction to increase efforts in support of the AMTEX and ACTI partnerships. Defense Programs plans to support AMTEX at a level of \$10 million, and ACTI at \$5 million in FY 1997; we also plan to support the Partnership for a New Generation of Vehicles (PNGV) by redeployment of Technology Transfer prior year balances in the amount of \$6.8 million. These efforts will be continued in FY 1998, with AMTEX requested at \$5.5 million, PNGV requested at \$7.5 million, and ACTI requested at \$12 million.

Community Assistance The Congress appropriated an additional \$22.6 million for a one time payment to eliminate the need for further assistance to the County of Los Alamos under the Atomic Energy Community Act, as amended. The FY 1998 request for Community Assistance is \$9.2 million, essentially all of which is for continuing support of the Los Alamos School Board.

Weapons Activities - EXECUTIVE BUDGET SUMMARY

Status of Prior Year Balances

In FY 1996, at the direction of the Congress, DP redeployed \$210.8 million of prior year uncosted balances to offset obligations for FY 1996 Weapons Activities. We did not propose using any prior year balances to finance the FY 1997 Congressional Budget Request, nor did the appropriations act direct use of prior year balances to offset needs for new budget authority. Overall, projected levels of prior year uncosted balances in Defense Programs are within the standard range we have established for good management of operations (12 percent for operating expenses). Based upon projected outlay rates, we expect total uncosted balances in our operations and maintenance accounts to decrease further in FY 1997.

TABLE 3
FIVE YEAR BUDGET PLAN SUMMARY
(Budget Authority in Thousands)

DEFENSE PROGRAMS	FY 1998 Budget Request	FY 1999 Budget Request	FY 2000 Estimate	FY 2001 Estimate	FY 2002 Estimate
Weapons Activities Operations and Maintenance	3,576,255	3,497,000	3,400,000	3,362,000	3,321,000
Defense Asset Acquisition	1,502,395	688,000	244,000	350,000	187,000
Total, Defense Programs Budget Authority	5,078,650 ⁴	4,165,000	3,644,000	3,712,000	3,508,000
Comprable Budget Authority based on an Incremental Method	4,044,450	4,196,572	4,103,164	3,966,858	3,578,729

The Five Year budget provides for Operations and Maintenance and an estimate for future construction projects included in the Defense Asset Acquisition account for Defense Programs, as well as Federal Program Direction. No funding is included for acquisition of the new tritium source, regardless of the technology or site chosen, although funds are included to complete the APT design and to build the tritium extraction facility.

⁴Includes \$1,034.2 million for the transition to up front funding of asset acquisition.

FY 1998 HIGHLIGHTS

Implementation of the Stockpile Stewardship and Management PEIS

The implementation of the Record of Decision for the Stockpile Stewardship and Management PEIS will set in motion several efforts related to production facility downsizing and relocation of missions. The Stockpile Management Restructuring Initiative is planned as a group of 5 separate but integrated construction projects to achieve these objectives. Funding for these efforts will be included in the Stockpile Management portion of the Defense Asset Acquisition account. In FY 1998, design funds are requested for projects at Oak Ridge Y-12 and Savannah River. Projects at Los Alamos National Laboratory, and the Kansas City and Pantex Plants are completing conceptual design activities in preparation for construction line items in FY 1999.

Transfer of funding target from EM associated with Re-Engineering Waste Management

Beginning in FY 1998, the Department will implement the Pilot Waste Management Re-Engineering Program at a limited number of sites, at which the responsibility for programs handling newly generated waste will be transferred from the Office of Environmental Management (EM) to the generating program. Throughout the implementation of the FY 1998 pilot, the regulatory accountability will remain with the program that currently holds the regulatory permits. In addition, the Office of Environmental Management will be responsible for any unavoidable funding shortfalls due to underestimates for FY 1998 waste generation.

Costs of managing newly generated wastes at the Kansas City Plant and the Savannah River Plant have been budgeted in Defense Programs. The Stockpile Management O&M request includes \$7.6 million for the pilot program; the Program Direction account contains \$0.5 million to fund 5 Federal FTE's transferred to from EM to assist with management of the pilot program. These Federal FTE's will be located at the Albuquerque Operations Office.

Funding for Greenville Road

The FY 1998 budget requests authority for the DOE to use up to \$6.8 million to pay for proposed improvements to Greenville Road, in Livermore, California. Pursuant to Section 3162 of the Senate Report accompanying the National Defense Authorization Act for FY 1997, Defense Programs Stockpile Stewardship, as landlord, has evaluated a request from the City of Livermore, California, for the DOE to provide funds to the city to pay for the United States Government share of the cost of the planned road improvements. If the payment is specifically authorized by Congress, DP would fund the requirement from overhead charges at the Lawrence Livermore National Laboratory and the Sandia National Laboratories, Livermore, only.

PROGRAM PERFORMANCE MEASURES

Detailed program performance measures have been developed during the FY 1998 budget process and are included as an integral part of the justification for each Weapons Activities program category. Summary level performance measures for Stockpile Management and Stockpile Stewardship are included within the respective Program Mission writeups. Following are the major programmatic indicators for overall Defense Programs performance in Stockpile Stewardship and Management activities:

Reduce the weapons stockpile by dismantling about 1,300 weapons in FY 1998 without adversely affecting the environment, public safety and health.

Maintain confidence in the enduring stockpile through the science based Stockpile Stewardship program, without underground nuclear testing.

Maintain the reliability of the future stockpile by developing a replacement source for tritium.

Begin physical construction on the National Ignition Facility.

Victor H. Reis
Assistant Secretary for Defense Programs

Date

TABLE 4
Detailed Program Summary
(Budget Authority and Obligations in Thousands)

Weapons Activities	FY 1996 Appropriations	FY 1997 Appropriations	FY 1998 Request	FY 1999 Request
Stockpile Stewardship				
Operations and Maintenance (non-comparable)	1,429,313	1,436,530	1,444,290	1,409,000
Construction Activities	119,905	220,237	--	--
<i>Comparability Adjustments</i>	(53,906)	--	--	--
Subtotal Stockpile Stewardship (comp)	1,495,312	1,656,767	1,444,290	1,409,000
Stockpile Management				
Operations and Maintenance (non-comp)	1,887,915	1,834,470	1,828,465	1,788,000
Construction Activities	113,625	94,361	--	--
<i>Comparability Adjustments</i>	(160,269)	--		--
Subtotal Stockpile Management (comp)	1,841,271	1,928,831	1,828,465	1,788,000
Program Direction				
Operations and Maintenance (non-comp)	114,774	325,600	303,500	300,000
<i>Comparability Adjustments</i>	210,099	--	--	--
Subtotal, Program Direction (comp)	324,873	325,600	303,500	300,000
Adjustment, Use of Prior Year Balances	(210,764)	--	--	--
Total Weapons Activities (comp)	3,450,692	3,911,198	3,576,255	3,497,000
Defense Asset Acquisition	n/a	n/a	1,502,395	688,000
Total Weapons Activities B/A (comparable)	3,450,692	3,911,198	5,078,650	4,185,000

This table displays the annual obligation estimates for each of the major programs in Weapons Activities. The Operations and Maintenance (O&M) amounts as well as the current year obligations to be funded from the Defense Asset Acquisition account (DAA) are combined to indicate the estimated program level.. However, beginning in FY 1998, the budget justification for O&M and construction projects funded in the DAA will be separate. The justification following this summary is for O&M only; the DAA information follows each decision unit. Discussion of O&M activities in the budget narrative is on a **comparable** basis to the FY 1998 request. Comparability adjustments are related to DOE-wide Congressional direction to transfer all Federal program direction expenditures to a single program direction line in each account beginning in FY 1997. The summary tables within the Stockpile Stewardship, Stockpile Management, and Program Direction decision units will reflect these changes so that the non-comparable decision unit totals are visible as well.

Weapons Activities - EXECUTIVE BUDGET SUMMARY

TABLE 5
DEFENSE PROGRAMS
CONSTRUCTION BUDGET AUTHORITY LEVELS
Dollars in Thousands

		Weapons Activities			Defense Asset Account		
Project Number	Project Title	Previous Approp	FY 1996 Approp	FY 1997 Approp	Old Incremental Funding Level	Transition To Full Funding	Total DP Budget Authority
CORE STOCKPILE STEWARDSHIP							
97-D-102	Dual-Axis Radiographic Hydrotest Facility, LANL	\$ 64,905	\$ 16,495	\$ 0	\$ 46,300	\$ 0	\$ 46,300
96-D-111	National Ignition Facility, LLNL		37,400	131,900	197,800	678,600	876,400
96-D-105	Contained Firing Facility Addition, LLNL		6,600	17,100	19,300	6,700	26,000
96-D-104	Processing & Environmental Technology Laboratory, SNL		1,980	14,100	0	29,820	29,820
96-D-103	Atlas, LANL		8,400	15,100	13,400	6,400	19,800
96-D-102	S. Stewardship Facilities Revitalization, Phase VI, Various Locations	0	2,520	19,250	19,810	31,296	51,106
95-D-102	CMR Upgrades Project, LANL	41,800	10,940	15,000	0	0	0
94-D-102	NWRD&T Facilities Revitalization, Phase V, Various Locations	17,000	12,200	7,787	0	0	0
93-D-102	Nevada Support Facility, NVO	23,000	15,650	0	0	0	0
90-D-102	NWRD&T Facilities Revitalization, Phase III, Various Locations	98,209	6,200	0	0	0	0
88-D-106	NWRD&T Facilities Revitalization, Phase II, Various Locations	302,459	1,500	0	0	0	0
87-D-104	Safeguards & Security Enhancements, Phase II, LLNL		20	0	0	0	0
New Start Construction Wedge					0	0	0
Subtotal, Weapons Stockpile Stewardship		\$ 547,373	\$ 119,905	\$ 220,237	\$ 296,610	\$ 752,816	\$ 1,049,426

TABLE 5 - Continued
DEFENSE PROGRAMS
CONSTRUCTION BUDGET AUTHORITY LEVELS
Dollars in Thousands

		Weapons Activities			Defense Asset Account		
Project Number	Project Title	Previous Approp	FY 1996 Approp	FY 1997 Approp	Old Incremental Funding Level	Transition To Full Funding	Total DP Budget Authority
CORE STOCKPILE MANAGEMENT							
99-D-XXX	SMRI-Capability Maintenance and Improvements Project, LANL	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
99-D-XXX	SMRI-Kansas City Plant II, KC	0	0	0	0	0	0
99-D-XXX	SMRI-Pantex Consolidation, PX	0	0	0	0	0	0
98-D-126	Accelerator Production of Tritium (APT), VL	0	0	0	67,865	100,725	168,590
98-D-125	Tritium Extraction Facility, SRS	0	0	0	9,650	29,803	39,453
98-D-124	SMRI-Y-12 Consolidation, Y-12	0	0	0	6,450	861	7,311
98-D-123	SMRI-Tritium Facility Modernization and Consolidation, SR	0	0	0	11,000	3,343	14,343
97-D-124	Steam Plant Wastewater Treatment Facility Upgrade, Y-12	0	0	600	1,900	0	1,900
97-D-123	Structural Upgrades, KC	0	0	1,400	0	16,600	16,600
97-D-122	Nuclear Materials Storage Facility Renovation, LANL	0	0	4,000	9,200	32,092	41,292
97-D-121	Consolidated Pit Packaging System, PX	0	0	870	0	0	0
96-D-126	Tritium Loading Line Modifications, SR	0	12,200	0	0	0	0
96-D-125	Washington Measurements Operations Fac., Andrews AFB, MD	0	900	3,825	0	0	0
96-D-123	Retrofit Chillers, Y-12	0	3,100	7,000	2,700	0	2,700
96-D-122	Sewage Treatment Upgrade, PX	0	600	100	6,900	3,700	10,600
95-D-122	Sanitary Sewer Upgrades, Y-12	2,200	6,300	10,900	12,600	0	12,600
95-D-102	CMR Upgrades Project, LANL	0	0	0	15,700	90,660	106,360
94-D-128	ES&H Analytical Laboratory, PX	1,800	4,000	0	0	3,000	3,000
94-D-127	Emergency Notification System, PX	2,000	2,000	2,200	0	0	0
94-D-125	Upgrade Life Safety, KC	2,000	5,500	5,200	2,000	0	2,000
94-D-124	Hydrogen Fluoride Supply System, Y-12	11,300	8,700	4,900	1,400	0	1,400
93-D-123	Nonnuclear Reconfiguration, Complex 21, VL	109,000	41,065	14,487	0	0	0
93-D-122	Life Safety Upgrades, Y-12	12,700	7,200	7,200	2,100	0	2,100
92-D-126	Replace Emergency Notification System, VL	25,600	0	0	3,200	0	3,200
88-D-123	Security Enhancements, PX	101,861	13,400	9,739	0	0	0
88-D-122	Facilities Capability Assurance Program (FCAP), VL	354,673	8,660	21,940	18,920	600	19,520
Subtotal, Weapons Stockpile Management		\$ 623,134	\$ 113,625	\$ 94,361	\$ 171,585	\$ 281,384	\$ 452,969
TOTAL, WEAPONS ACTIVITIES and DEFENSE ASSET ACQUISITION		\$ 1,170,507	\$ 233,530	\$ 314,598	\$ 468,195	\$ 1,034,200	\$ 1,502,395

Table 6
DEFENSE PROGRAMS
FY 1998 CONGRESSIONAL BUDGET REQUEST
DEFENSE PROGRAMS FUNDING BY SITE
(Dollars in Thousands)

- - PLANNING ESTIMATES ONLY - -									
	TOTAL DEFENSE PROGRAMS			Weapons Activities			Defense Asset Acquisition		
	FY 1996	FY 1997	FY 1998	FY 1996	FY 1997	FY 1998	FY 1996	FY 1997	FY 1998
ALBUQUERQUE OPERATIONS OFFICE									
Albuquerque Operations Office	275,268	303,136	333,091	275,268	303,136	277,596	0	0	55,495
Kansas City Plant	301,118	292,972	275,983	301,118	292,972	270,113	0	0	5,870
Los Alamos National Laboratory	573,287	618,573	741,245	573,287	618,573	637,995	0	0	103,250
Pantex Plant	280,031	270,929	237,100	280,031	270,929	230,200	0	0	6,900
Pinellas Plant	6,537	18,267	0	6,537	18,267	0	0	0	0
Sandia National Laboratories	656,659	627,374	605,310	656,659	627,374	599,827	0	0	5,483
SUBTOTAL, AL	2,092,900	2,131,251	2,192,729	2,092,900	2,131,251	2,015,731	0	0	176,998
CHICAGO OPERATIONS OFFICE									
Argonne National Laboratory	1,910	216	303	1,910	216	303	0	0	0
Brookhaven National Laboratory	5,748	3,981	6,933	5,748	3,981	5,763	0	0	1,170
Chicago Operations Office	51	90	8,282	51	90	8,282	0	0	0
SUBTOTAL, CH	7,709	4,287	15,518	7,709	4,287	14,348	0	0	1,170
IDAHO OPERATIONS OFFICE	16,802	16,737	14,617	16,802	16,737	14,617	0	0	0
NEVADA OPERATIONS OFFICE	254,664	230,748	225,645	254,664	230,748	222,978	0	0	2,667
OAK RIDGE OPERATIONS OFFICE									
Oak Ridge Operations Office	16,669	15,407	14,621	16,669	15,407	14,621	0	0	0
Oak Ridge Y-12	410,639	407,813	394,676	410,639	407,813	349,276	0	0	45,400
OR Inst. for Sci & Ed (ORISE)	2,457	4,515	2,818	2,457	4,515	2,818	0	0	0
OR Sci & Tech'y Institute (OSTI)	632	420	520	632	420	520	0	0	0
Oak Ridge National Laboratory	10,515	12,567	11,998	10,515	12,567	11,998	0	0	0
SUBTOTAL, OR	440,912	440,722	424,633	440,912	440,722	379,233	0	0	45,400

OAKLAND OPERATIONS OFFICE									
General Atomics	11,369	10,360	10,500	11,369	10,360	10,500	0	0	0
Lawrence Berkeley Laboratory	0	950	0	0	950	0	0	0	0
Lawrence Livermore National Lab	464,571	597,645	641,204	464,571	597,645	422,794	0	0	218,410
Naval Research Laboratory	8,500	9,000	9,000	8,500	9,000	9,000	0	0	0
Oakland Operations Office	17,220	13,597	13,296	17,220	13,597	13,296	0	0	0
University of Rochester	21,023	21,889	23,600	21,023	21,889	23,600	0	0	0
SUBTOTAL, OAK	522,683	653,441	697,600	522,683	653,441	479,190	0	0	218,410
OHIO FIELD OFFICE									
Fernald	1,800	2,931	1,200	1,800	2,931	1,200	0	0	0
Mound Plant	3,346	20,733	0	3,346	20,733	0	0	0	0
SUBTOTAL, OH	5,146	23,664	1,200	5,146	23,664	1,200	0	0	0
RICHLAND OPERATIONS OFFICE									
Pacific Northwest Laboratory	26,813	38,884	48,945	26,813	38,884	48,945	0	0	0
Richland Operations Office	1,465	1,437	294	1,465	1,437	294	0	0	0
SUBTOTAL, RL	28,278	40,321	49,239	28,278	40,321	49,239	0	0	0
ROCKY FLATS FIELD OFFICE	46,962	39,000	44,000	46,962	39,000	44,000	0	0	0
SAVANNAH RIVER OPERATIONS OFFICE									
Savannah River Operations Office	8,052	6,060	6,144	8,052	6,060	6,144	0	0	0
Savannah River Westinghouse	147,148	125,436	134,416	147,148	125,436	111,616	0	0	22,800
SUBTOTAL, SR	155,200	131,496	140,560	155,200	131,496	117,760	0	0	22,800
HEADQUARTERS	90,200	199,531	1,272,909	90,200	199,531	237,959	0	0	1,034,950 *
Comparability Adjustment	4,076	0	0	4,076	0	0	0	0	0
GRAND TOTAL	3,665,532	3,911,198	5,078,650	3,665,532	3,911,198	3,576,255	0	0	1,502,395

* Additional commitment to complete ongoing phases of construction projects. To be distributed to contractors on year by year basis.

Control Levels:	3,665,532	3,911,198	NA	3,665,532	3,911,198	NA	0	0	1,502,395
	0	0	NA	0	0	NA	0	0	0

Table 7
DEFENSE PROGRAMS
FY 1998 CONGRESSIONAL BUDGET REQUEST
Contractor Employment Estimates

	Total Weapons Activities			Weapons Stockpile Stewardship			Weapons Stockpile Management		
	FY 1996	FY 1997	FY 1998	FY 1996	FY 1997	FY 1998	FY 1996	FY 1997	FY 1998
ALBUQUERQUE OPERATIONS OFFICE									
Kansas City Plant	3,085	3,275	2,666	71	59	50	3,014	3,216	2,616
Los Alamos National Laboratory	3,565	3,860	3,860	2,284	2,250	2,250	1,281	1,610	1,610
Pantex Plant	3,016	2,665	2,665	10	3	3	3,006	2,662	2,662
Pinellas Plant	11	0	0	0	0	0	11	0	0
Sandia National Laboratories	4,085	3,805	3,708	2,573	2,335	2,300	1,512	1,470	1,408
SUBTOTAL, AL	13,762	13,605	12,899	4,938	4,647	4,603	8,824	8,958	8,296
CHICAGO OPERATIONS OFFICE									
Argonne National Laboratory	13	13	14	3	3	3	10	10	11
Brookhaven National Laboratory	24	24	27	0	0	0	24	24	27
SUBTOTAL, CH	37	37	41	3	3	3	34	34	38
IDAHO OPERATIONS OFFICE	132	127	125	3	0	0	129	127	125
Wackenhut Services, NV	144	145	145	144	145	145	0	0	0
Bechtel, Nevada	1,698	1,480	1,480	1,431	1,245	1,245	267	235	235
NEVADA OPERATIONS OFFICE	1,842	1,625	1,625	1,575	1,390	1,390	267	235	235
OAK RIDGE OPERATIONS OFFICE									
Oak Ridge Operations Other	74	59	49	3	2	2	71	57	47
Oak Ridge Y-12	4,019	3,904	3,634	217	67	67	3,802	3,837	3,567
ORISE	41	47	47	0	0	0	41	47	47
SUBTOTAL, OR	4,134	4,010	3,730	220	69	69	3,914	3,941	3,661
OAKLAND OPERATIONS OFFICE									
Lawrence Livermore National Laboratory	3,370	3,342	3,385	3,141	3,100	3,100	229	242	285
OHIO OPERATIONS (Mound Plant)	38	0	0	0	0	0	38	0	0
RICHLAND OPERATIONS OFFICE	127	115	115	0	0	0	127	115	115
ROCKY FLATS OPERATIONS OFFICE	467	450	450	0	0	0	467	450	450
SR Ecology Lab	0	0	0	0	0	0	0	0	0
Westinghouse Savannah River Co.	1,343	1,374	1,132	10	8	8	1,333	1,366	1,124
Wackenhut Services, SR	48	47	47	0	0	0	48	47	47
SAVANNAH RIVER OPERATIONS OFFICE	1,391	1,421	1,179	10	8	8	1,381	1,413	1,171
TOTAL, DEFENSE PROGRAMS	25,300	24,732	23,549	9,890	9,217	9,173	15,410	15,515	14,376

Table 8

WEAPONS ACTIVITIES
Federal Employment by Site
FY 1996 - FY 1998

	Total	Headquarters	Albuquerque	Transportation Safeguards-AL	Nevada	Oakland	Oak Ridge	Savannah River
FY 1996	2,069	359	875	361	301	86	72	15
FY 1997	2,022	335	885	355	279	80	70	18
FY 1998	1,925	290	870	355	249	77	66	18

TABLE 9
FY 1998 Congressional Budget Request Crosscut
Funding Against Activities is Non-Exclusive - Funding May Be Reflected Against Multiple Activities
(\$ in thousands)

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>
Partnership for New Generation of Vehicles	13,400	10,000	7,500
American Textiles Partnership	7,200	10,000	5,500
Advanced Computation and Technology Initiative	14,400	5,000	12,000
Pollution Prevention	10,740	10,740	10,740
Former Soviet Union	5,490	4,880	4,500
Science and Education Programs	10,000	10,000	9,000
Technology Transfer	149,000	59,400	60,000

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
WEAPONS ACTIVITIES
(Tabular dollars in thousands, Narrative in whole dollars)

WEAPONS STOCKPILE STEWARDSHIP

PROGRAM MISSION

NOTE: Detailed site funding for Stockpile Stewardship is provided in the Defense Programs Executive Budget Summary.
Construction line item data sheets are included in the Defense Asset Acquisition account - Stewardship detail, following the Weapons Stockpile Stewardship budget narrative.

The Weapons Stockpile Stewardship program provides the necessary scientific and engineering tools to ensure the safety, security, and reliability of the nuclear stockpile without nuclear testing. It includes research and development to provide the technology required for stockpile management. At the most fundamental level, Weapons Stockpile Stewardship rests on the judgment and skills of experienced civilian and military specialists, supported by essential experimental and computational resources, and the preservation of their knowledge base. Weapon systems deteriorate over time and will require knowledgeable surveillance, evaluation and assessment, and, in time, modifications to extend their operational lifetime. This program will enable the DOE to identify and address these changes, in the most cost efficient manner possible, and, at the same time, maintain confidence in the stockpile without relying on nuclear testing.

By Presidential Decision Directive and Act of Congress (P.L. 103-160), the Department was directed to "establish a stewardship program to ensure the preservation of the core intellectual and technical competencies of the U.S. in nuclear weapons." In his announcement on August 11, 1995 to seek a "zero" yield Comprehensive Test Ban Treaty (CTBT), the President included a series of safeguards that define the conditions necessary for a CTBT, which the United Nations General Assembly endorsed, and the President later signed on September 24, 1996. Safeguard A specifically calls for a science-based Stockpile Stewardship (SBSS) program to ensure the safety and reliability of the stockpile and Safeguard C requires that the U.S. maintain the basic capability to resume underground nuclear testing.

GOALS: The Stockpile Stewardship program supports the following goals of Defense Programs:

- Provide high confidence in the safety, security, reliability and performance of the enduring U.S. stockpile, without nuclear testing, to ensure the effectiveness of the U.S. nuclear deterrent while simultaneously supporting U.S. arms control and nonproliferation policies.
- Provide the ability to resume U.S. nuclear testing and reconstitute nuclear weapons production capacities, consistent with Presidential Directives, the Nuclear Posture Review, and the START II Treaty, should national security so demand in the future.

OBJECTIVES: Two major programmatic performance indicators of the Stockpile Stewardship program are:

- 1) Maintain confidence in the enduring stockpile through the science-based Stockpile Stewardship (SBSS) program, without underground nuclear testing.
- 2) Begin physical construction of the National Ignition Facility.

The Stockpile Stewardship program also contributes to meeting Defense Programs' other major performance objectives.

PROGRAM MISSION - STOCKPILE STEWARDSHIP (Continued)

PERFORMANCE MEASURES:

For **FY 1998**, the significant overall performance measures for the Stockpile Stewardship program include:

- Conduct surveillance and certify that the stockpile meets directed requirements.
- Conduct four subcritical experiments at the Nevada Test Site in support of the Stockpile Stewardship program to obtain data needed for analysis with advanced computer codes and to address issues related to new manufacturing technologies and stockpile aging.
- Begin facility construction of the National Ignition Facility (NIF) and demonstrate target and laser technologies needed to support NIF ignition capability.
- Within the Accelerated Strategic Computing Initiative (ASCI) program, effect a fully functional portion of a 3 TeraOps machine of clustered shared memory processors (SMP) architecture at a national laboratory for concurrent development of its operating system and test implementation of existing 3D codes that have been developed for other SMP architectures prior to the final delivery in the first quarter of FY 1999. Fully implement partnerships with industry and universities for technical assistance in key ASCI code development and simulations efforts.
- Complete design of the second arm of the Dual Axis Radiographic Hydrodynamic Test Facility (DARHT) and complete the research and development required to support a Critical Decision One for the Advanced Hydrodynamics Facility.
- Begin construction on ATLAS, a 36 megajoule, 45-50 mega-amp pulsed power facility.

SIGNIFICANT ACCOMPLISHMENTS AND PROGRAM SHIFTS:

During **FY 1996**, implementation of the Weapons Stockpile Stewardship program, initiated in FY 1994, continued in accordance with the Stockpile Stewardship and Management Plan with the following specific accomplishments:

- Conducted weapons systems stockpile surveillance testing.
- Initiated Dual Revalidation for the W76.
- Developed and implemented an annual stockpile certification and assessment process.
- Established a program and prepared environmental documentation for subcritical experiments at the Nevada Test Site.
- Restarted construction of the Dual Axis Radiographic Hydrodynamic Test Facility (DARHT) at the Los Alamos National Laboratory (LANL).
- Developed a Tri-Laboratory Advanced Hydrodynamic Radiography Technology Development plan to guide and coordinate the DOE advanced hydrotest capabilities.
- Initiated two industry partnerships within the Accelerated Strategic Computing Initiative (ASCI) program plan.
- Initiated and nearly completed Title I design of the National Ignition Facility (NIF) (completed in November 1996) and initiated NIF optics vendor facilitization.

The **FY 1997** program will continue the implementation of the Stockpile Stewardship and Management Plan through an ongoing effort to increase the utilization of the foundation research and development program to meet the direct requirements to assess and maintain the stockpile. In FY 1997, Defense Programs plans to:

- Conduct two subcritical experiments to provide required experimental data as well as exercise the test readiness capabilities of the laboratories and the Nevada Test Site.
- Investigate competing technologies to meet the advanced radiography requirements of the science-based Stockpile Stewardship program.
- Initiate the third Accelerated Strategic Computing Initiative (ASCI) industry partnership and continue development of high-fidelity 3D codes necessary to implement the program plan to provide the leading-edge computational modeling and simulation capabilities that are essential to maintain the safety, reliability, and performance of the stockpile in the absence of underground nuclear testing.
- Complete engineering and design activities on the major Stockpile Stewardship programmatic construction projects begun in FY 1996: the National Ignition Facility, the Contained Firing Facility addition to the Flash X-Ray facility at Site 300 at Lawrence Livermore National Laboratory (LLNL), the Atlas facility at Los Alamos National Laboratory (LANL), and the Processing and Environmental Technology Laboratory (PETL) at Sandia National Laboratories.
- Complete transition of the Technology Transfer program from private industry driven Cooperative Research and Development Agreements to Stockpile Stewardship driven or specific projects in response to the evolution of the requirements of the post-cold war, post-underground nuclear testing environment of the Weapons Stockpile Stewardship program. Several initiatives will continue in FY 1997 such as the American Textile Partnership (AMTEX), the Partnership for a New Generation of Vehicles (PNGV), and the Advanced Computational Technology Initiative (ACTI). It is not expected that any major new partnerships will be initiated in FY 1997.

PROGRAM MISSION - STOCKPILE STEWARDSHIP (Continued)

The **FY 1998** program represents the first year of full implementation of the Stockpile Stewardship and Management Plan. Research and development efforts will continue on the near- and long-term requirements of the nuclear weapons stockpile. In particular, efforts will be placed on providing new methods for assessing, manufacturing, and certifying weapons components and systems without the use of underground nuclear testing. Along with the re-focusing of research and development efforts to ensure that ongoing efforts align with the highest programmatic requirements, emphasis will be placed on programs and initiatives which will provide experimental data and analysis without underground nuclear testing. There is sufficient funding for the maintenance of nuclear test readiness as directed by the President in Safeguard C of the Comprehensive Test Ban Treaty.

Funding changes from FY 1997 include:

- Increased funding for **direct research and development in support of the stockpile** as detailed in the Stockpile Stewardship and Management Plan and other agreements with the Department of Defense. (+\$10.6 million)
- Support of **four subcritical experiments at the Nevada Test Site**. (+\$7.4 million)
- Decreased funding for **core stockpile stewardship and research and advanced technology** activities. (-\$41.8 million)
- Continued implementation of the **Accelerated Strategic Computing Initiative (ASCI)** Program Plan (+\$53.2) to enhance code and software development to take advantage of the hardware development programs, and the ongoing efforts to meet the laboratories current **computational and modeling** requirements. (-\$3.7 million) (+\$49.5 million)
- Decreased funding for the **Inertial Confinement Fusion (ICF) operations & maintenance funding**; however, funding is provided to ensure that required ICF technology development activities are on schedule to support the National Ignition Facility initiative. (-\$17.5 million)
- **Technology Transfer** and **Education** programs at approximately the FY 1997 level. Within the Education program, approximately 15 percent will be for Historically Black Colleges and Universities as well as other minority institutions. (-\$.4 million)
- Transfer of construction line items to the Defense Asset Acquisition account. (-\$88.3 million)

- Changes from FY 1997 to FY 1998 on line item **construction projects** now shown in the **Defense Asset Acquisition account**:
 - The FY 1998 request includes \$752.8 million in Budget Authority to transition ongoing Stockpile Stewardship construction projects from incremental funding to full up front funding.
 - Radiographic activities to complete the first arm of the **Dual Axis Radiographic Hydrodynamic Test (DARHT) Facility**, activities in support of DARHT's second arm including engineering design and construction of an integrated test stand and implementation of the second phase of the DARHT phased containment plan.
 - Full support of the construction schedule for the **National Ignition Facility**. The Total Estimated Cost (TEC) is increased by \$203.1 million.
 - Two new environmental, safety, and health infrastructure subprojects within the **Facilities Revitalization, Phase VI** construction line item. The TEC is increased by \$3.2 million.
 - Deferral of the **Processing and Environmental Technology Laboratory**.
 - Transfer of the **Chemistry and Materials Research Laboratory** to the Weapons Stockpile Management program.

FACILITY OPERATIONS:

STOCKPILE STEWARDSHIP SITES: Weapons Stockpile Stewardship activities are conducted predominantly at the three defense laboratories, Lawrence Livermore, Los Alamos, and Sandia National Laboratories in California and New Mexico, and at the Nevada Test Site. Funding is also provided to the University of Rochester, the Naval Research Laboratory, and General Atomics through the Inertial Confinement Fusion program and to various production sites for research and development activities related to Stockpile Stewardship. Other miscellaneous locations are funded through the Weapons Stockpile Stewardship program as noted on the funding by location table included in the Weapons Activities Executive Budget Summary.

PROGRAM MISSION - STOCKPILE STEWARDSHIP (Continued)

FACILITY OPERATIONS: (Continued)

The Weapons Stockpile Stewardship program is responsible for maintaining the research and development (R&D) infrastructure, which includes not only the physical complex of the three laboratories and the Nevada Test Site, but also the scientists and engineers and the basic and applied research base on which the health and technical capabilities of the laboratories and the Test Site rest. The success of the Stockpile Stewardship is dependent upon Defense Programs' ability to maintain the level of scientific based capability needed to provide the ongoing technology and science resources required to insure that any Department question can be addressed by the best scientists and engineers using the most advanced sciences and technologies. This capability is of primary importance for the nuclear weapons stockpile responsibilities of the Department, but also supports the needs of other users of the laboratories and the Nevada Test Site by maintaining basic capabilities.

Defense Programs oversees and coordinates site-wide environmental documentation activities at the three laboratories and the Nevada Test Site, as the Department's landlord, although funding is provided by all affected activities at each site. The Record of Decision on the Nevada Test Site (NTS) site-wide environmental impact statement (SWEIS) was completed in December 1996. The Los Alamos National Laboratory (LANL) SWEIS is expected to be completed in the third quarter of FY 1997. The process to conduct Sandia National Laboratories SWEIS has begun, with a Notice of Intent expected to be completed in the third quarter of FY 1997. Defense Programs will also conduct a five-year review of the Lawrence Livermore National Laboratory SWEIS, originally completed in 1992, to determine if the document is current, requires revisions, or whether the Lawrence Livermore National Laboratory (LLNL) requires a new SWEIS.

Management and funding responsibilities for several production related facilities at LANL, including the Plutonium Facility (Technical Area 55), the Chemistry and Materials Research Laboratory (CMR), and the Los Alamos Criticality Experiments Facility (LACEF), are being transferred to the Weapons Stockpile Management decision unit in FY 1998.

The City of Livermore has requested the Department to pay up to \$3.5 million in FY 1998 and up to \$3.3 million in FY 1999 for improvements to Greenville Road in Livermore, California. Defense Programs, as the landlord for LLNL, proposes to fund this payment through the use of overhead charges at both the Lawrence Livermore and Sandia-Livermore National Laboratories.

The budget also includes \$6.0 million to complete the first of two planned upgrades, initiated in FY 1997, of the Los Alamos Neutron Science Center (LANSCE) - a short pulse spallation source. These upgrades will allow Stockpile Stewardship and Management Program researchers to obtain dynamic and surveillance measurements more quickly and accurately. It will also improve facility reliability and maintainability and reduce worker radiation exposure.

CONCEPTUAL DESIGN REPORTS and POST-CONCEPTUAL DESIGN ENGINEERING: During the budget request period, FY 1996-FY 1999, there are no Conceptual Design Reports (CDR) for new construction projects which will exceed \$3 million in cost. However, Defense Programs may choose to begin conceptual design activities for the Advanced Hydrotest Facility, the Advanced Radiation Source Facility, and the Long Pulse Spallation Source enhancement to the LANSCE. It is estimated that each of these potential conceptual design reports may cost in excess of \$1 million.

BUDGET STRUCTURE:

The Weapons Stockpile Stewardship budget request is organized in the following manner:

- **SUMMARY LEVEL FUNDING DATA** is provided for all of Weapons Stockpile Stewardship followed by a funding table showing detail for operations and maintenance funding, including capital equipment and general plant projects. Starting in FY 1998, funding for line item construction projects is shown in the Defense Asset Acquisition account. Funding by site and contractor employment by site are included in the Defense Programs Executive Budget Summary.
- **CORE STOCKPILE STEWARDSHIP** supports the specific activities required for science-based Stockpile Stewardship through the maintenance of the physical and intellectual infrastructure at Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Sandia National Laboratories and the Nevada Test Site. Major program elements include Programs and Initiatives, Research and Advanced Technology, and Testing Capabilities and Readiness.
- **INERTIAL CONFINEMENT FUSION** is a research and advanced technology development effort directly supporting the Department's national security mission in Stockpile Stewardship. The near-term goal of the program is the successful demonstration of a thermonuclear ignition and moderate fusion gain in a laboratory environment. Construction funding for the National Ignition Facility is shown in the Defense Asset Acquisition account.
- **TECHNOLOGY TRANSFER AND EDUCATION** directly share expertise and scientific development in the laboratories with the private sector and obtain skills and knowledge from the private sector for the enhancement of laboratory capabilities. Technology Transfer strengthens the science and technology base through participation in cooperative, dual-benefit partnerships with private industry. Education initiatives support science education activities that exercise the unique capabilities of the laboratories with emphasis on graduate and post-graduate activities.
- **DEFENSE ASSET ACQUISITION - DEFENSE PROGRAMS - WEAPONS STOCKPILE STEWARDSHIP CONSTRUCTION DATA SHEETS** follow the Stockpile Stewardship budget narrative.

FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
WEAPONS STOCKPILE STEWARDSHIP
(Dollars in Thousands)

Funding Schedule:

Program Activity	FY 1996	FY 1997	FY 1998	\$ Change	% Change	FY 1999
CORE STOCKPILE STEWARDSHIP						
OPERATIONS & MAINTENANCE						
PROGRAMS & INITIATIVES						
DIRECT STOCKPILE ACTIVITIES						
Stockpile Readiness Program	39,024	40,395	41,226	831	2%	
Enduring Stockpile Program	76,823	83,806	90,869	7,063	8%	
Future Stockpile Program	18,054	16,460	18,068	1,608	10%	
Stockpile Reduction Program	13,998	11,810	12,944	1,134	10%	
Subtotal, Direct Stockpile Activities	\$ 147,899	\$ 152,471	\$ 163,107	\$ 10,636	7%	\$
EXPERIMENTAL ACTIVITIES						
Archiving	8,505	13,255	13,448	193	1%	
Nuclear Component Assessment	22,624	21,450	33,857	12,407	58%	
Nonnuclear Component Assessment	4,600	6,060	5,431	(629)	-10%	
Subtotal, Experimental Activities	\$ 35,729	\$ 40,765	\$ 52,736	\$ 11,971	29%	\$
ACCELERATED STRATEGIC COMPUTING INITIATIVE						
Advanced Applications	32,500	75,050	107,365	32,315	43%	
Platforms	31,500	37,500	37,380	(120)	-0%	
Problem Solving Environments	15,500	23,950	37,055	13,105	55%	
Strategic Alliances and Investigations	5,000	8,000	14,500	6,500	81%	
One Program/Three Labs	1,015	7,115	8,500	1,385	19%	
Subtotal, Accelerated Strategic Computing Initiative	\$ 85,515	\$ 151,615	\$ 204,800	\$ 53,185	35%	\$
SPECIAL PROJECTS						
Weapons Transportation Safeguards Systems	3,000	0	0	0	0%	
Extraordinary ES&H Site Remediation	2,900	3,254	663	(2,591)	-80%	
Joint DoD/DOE Munitions Technology Development Program	16,496	14,153	14,033	(120)	-1%	
Other Activities	12,189	4,039	3,400	(639)	-16%	
Subtotal, Special Projects	\$ 34,585	\$ 21,446	\$ 18,096	\$ (3,350)	-16%	\$
THREAT ASSESSMENT & TREATY IMPLEMENTATION	\$ 18,355	\$ 16,965	\$ 0 ^{1/}	\$ (16,965)	-100%	\$
Subtotal, PROGRAMS & INITIATIVES	\$ 322,083	\$ 383,262	\$ 438,739	\$ 55,477	14%	\$

^{1/} The Threat Assessment and Treaty Implementation program is no longer being managed as a separate program; activities and the associated funding have been re-merged with other Stockpile Stewardship categories.

FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
WEAPONS STOCKPILE STEWARDSHIP
(Dollars in Thousands)

Funding Schedule:

<u>Program Activity</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>\$ Change</u>	<u>% Change</u>	<u>FY 1999</u>
CORE STOCKPILE STEWARDSHIP (Continued)						
CORE RESEARCH & ADVANCED TECHNOLOGY						
PERFORMANCE ASSESSMENT SCIENCE & TECHNOLOGY						
Performance Assessment	29,065	42,795	32,795	(10,000)	-23%	
Physics	130,998	118,295	116,105	(2,190)	-2%	
Los Alamos Neutron Science Center	34,294	37,160	40,916	3,756	10%	
Advanced Hydrodynamic Radiography	2,000	11,710	6,484	(5,226)	-45%	
Subtotal, Performance Assessment S & T	\$ 196,357	\$ 209,960	\$ 196,300	\$ (13,660)	-7%	\$
SYSTEMS COMPONENTS SCIENCE & TECHNOLOGY						
Systems Engineering	65,880	64,530	66,756	2,226	3%	
Electronics, Photonics, Sensors & Mechanical Components	34,100	31,605	34,795	3,190	10%	
Advanced Manufacturing	8,464	22,790	14,966	(7,824)	-34%	
Subtotal, Systems Components S & T	\$ 108,444	\$ 118,925	\$ 116,517	\$ (2,408)	-2%	\$
CHEMISTRY AND MATERIALS SCIENCE & TECHNOLOGY						
Chemistry and Materials	15,765	15,200	16,175	975	6%	
High Explosives	13,985	13,825	14,393	568	4%	
Special Nuclear Materials	29,154	29,530	27,821	(1,709)	-6%	
Tritium	6,300	7,314	3,441	(3,873)	-53%	
Subtotal, Chemistry and Materials S & T	\$ 65,204	\$ 65,869	\$ 61,830	\$ (4,039)	-6%	\$
STOCKPILE COMPUTATIONS AND MODELING	\$ 112,647	\$ 155,145	\$ 151,500	\$ (3,645)	-2%	\$
Subtotal, CORE RESEARCH & ADVANCED TECHNOLOGY	\$ 482,652	\$ 549,899	\$ 526,147	\$ (23,752)	-4%	\$
TESTING CAPABILITIES & READINESS	\$ 166,767	\$ 161,620	\$ 157,002	\$ (4,618)	-3%	\$
LABORATORY CAPITAL EQUIPMENT	\$ 33,294	\$ 30,349	\$ 27,527	\$ (2,822)	-9%	\$
LABORATORY GENERAL PLANT PROJECTS	\$ 8,100	\$ 7,440	\$ 8,875	\$ 1,435	19%	\$
TOTAL, CORE SS OPERATIONS & MAINTENANCE	\$ 1,012,896	\$ 1,132,570	\$ 1,158,290	\$ 25,720	2%	\$
CONSTRUCTION LINE ITEMS	\$ 82,505	\$ 88,337	\$ 0	\$ (88,337)	-100%	\$
TOTAL CORE STOCKPILE STEWARDSHIP	\$ 1,095,401	\$ 1,220,907	\$ 1,158,290	\$ (62,617)	-5%	\$

FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
WEAPONS STOCKPILE STEWARDSHIP
(Dollars in Thousands)

Funding Schedule:

<u>Program Activity</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>\$ Change</u>	<u>% Change</u>	<u>FY 1999</u>
INERTIAL CONFINEMENT FUSION						
<i>OPERATIONS & MAINTENANCE</i>						
Target Physics, Theory, and Modeling	\$ 83,384	\$ 86,507	\$ 86,691	\$ 184	0%	\$
Target Development, Fabrication, and Handling	32,137	30,732	30,654	(78)	-0%	
Laser and Optics Technology Development	46,672	46,687	55,118	8,431	18%	
National Ignition Facility - Other Project Costs	23,600	59,200	31,300	(27,900)	-47%	
Advanced Driver Development	15,476	8,776	8,634	(142)	-2%	
Other ICF Activities	2,242	2,658	4,603	1,945	73%	
TOTAL, ICF OPERATIONS & MAINTENANCE	<u>\$ 203,511</u>	<u>\$ 234,560</u>	<u>\$ 217,000</u>	<u>\$ (17,560)</u>	<u>-7%</u>	<u>\$</u>
<i>CONSTRUCTION</i>						
96-D-111, National Ignition Facility	\$ 37,400	\$ 131,900	\$ 0	\$ (131,900)	-100%	\$
TOTAL, INERTIAL CONFINEMENT FUSION	<u>\$ 240,911</u>	<u>\$ 366,460</u>	<u>\$ 217,000</u>	<u>\$ (149,460)</u>	<u>-41%</u>	<u>\$</u>
TECHNOLOGY TRANSFER & EDUCATION						
<i>OPERATIONS & MAINTENANCE</i>						
TECHNOLOGY TRANSFER	\$ 149,000	\$ 59,400	\$ 60,000	\$ 600	1%	\$
EDUCATION	\$ 10,000	\$ 10,000	\$ 9,000	\$ (1,000)	-10%	\$
TOTAL, TECH TRANSFER & EDUCATION O&M	<u>\$ 159,000</u>	<u>\$ 69,400</u>	<u>\$ 69,000</u>	<u>\$ (400)</u>	<u>-1%</u>	<u>\$</u>
Subtotal, WEAPONS STOCKPILE STEWARDSHIP	<u>\$ 1,495,312</u>	<u>\$ 1,656,767</u>	<u>\$ 1,444,290</u>	<u>\$ (212,477)</u>	<u>-13%</u>	<u>\$ *****</u>
Adjustment	\$ (73,286)	\$ 0	\$ 0	\$ 0		\$
Subtotal, Directed Program	<u>\$ 1,422,026</u>	<u>\$ 1,656,767</u>	<u>\$ 1,444,290</u>	<u>\$ (212,477)</u>	<u>-13%</u>	<u>\$</u>
Comparability Adjustment	\$ 53,906	\$ 0	\$ 0	\$ 0		\$
TOTAL, NEW BUDGET AUTHORITY (Noncomparable)	<u>\$ 1,475,932</u>	<u>\$ 1,656,767</u>	<u>\$ 1,444,290</u>	<u>\$ (212,477)</u>	<u>-13%</u>	<u>\$ *****</u>
DEFENSE ASSET ACQUISITION - DEFENSE PROGRAMS						
STOCKPILE STEWARDSHIP	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 1,049,426</u>	<u>\$ 1,049,426</u>	<u>100%</u>	<u>\$ 109,263</u>

NOTE: Starting in FY 1998, construction line items are included in the Defense Asset Acquisition account.

FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
 WEAPONS STOCKPILE STEWARDSHIP
 CAPITAL OPERATING EXPENSES
 (Detail and Crosscut Dollars in Thousands)

	Prior Years	Fiscal Year					
		1996	1997	1998	FY 1999	\$ CHG	% CHG
Other (Line Item) Project Costs							
Conceptual Design Costs in Excess of \$3 million							
96-D-111, National Ignition Facility	\$ 12,000	\$ 250	\$ 150	\$ 0	\$ 0	\$ (150)	-100%
Capital Equipment - Core Stockpile Stewardship							
Basic Capital Equipment							
Laboratory Basic Equipment		33,294	30,349	27,527			
Testing Capabilities & Readiness (Basic)		7,400	6,000	7,000			
MIE's							
Production Realization Research Laboratory, SNL		0	0	3,250			
Very Large-Scale Integrated Circuit Test System, SNL		0	3,100	0			
LANSCE Upgrade		0	3,000	6,000			
Automated Data Processing Equipment							
Visualization Server, LANL		0	0	2,000			
Computations & Modeling		0	38,645	38,600			
Communications Upgrade, SNL		0	0	3,000			
Core Production Computing, A, LLNL		0	0	3,000			
Distributed Data Management, LLNL		0	0	2,000			
High Performance Storage System, LANL		0	0	3,000			
Network Routers/Servers, LANL		0	0	2,000			
Production Blue Computer, LANL		0	0	10,000			
Production Processing Facility, LLNL		0	3,000	0			
System Interconnection Network, LLNL		0	2,000	0			
Supercomputer 97, SNL		0	5,000	0			
ASCI Blue Machine, LANL		10,000	10,000	5,000			
ASCI Blue Machine, Phases A, B, and C; LLNL		5,000	5,000	5,000			
Meiko CS-2 Tech Insertion, LLNL		1,000	0	0			
Cray J-90 SMP Upgrade, LLNL		1,000	0	0			
Object Data Archive I, LLNL		3,000	0	0			
Prior Year ADP Projects		(1,306)	0	0			
Subtotal, ADP		18,694	63,645	73,600			
Subtotal, Core Stockpile Stewardship	\$	59,388	\$ 106,094	\$ 117,377		\$ 11,283	11%
Inertial Confinement Fusion		7,400	7,400	7,400		0	0%
Technology Transfer & Education		0	0	0	TBD	0	0%
Subtotal, Capital Equipment -Core Stockpile Stewardship	\$	66,788	\$ 113,494	\$ 124,777	\$ TBD	\$ 11,283	10%
General Plant Projects							
Testing Capabilities & Readiness	\$	(597)	\$ 3,000	\$ 3,057	\$	\$ 57	2%
Other General Plant Projects	\$	8,100	\$ 7,440	\$ 8,875	\$	\$ 1,435	19%
Subtotal, General Plant Projects	\$	7,503	\$ 10,440	\$ 11,932	\$ TBD	\$ 1,492	14%
Total, Capital Operating Expenses	\$	74,541	\$ 124,084	\$ 136,709	\$ TBD	\$ 12,625	10%

WEAPONS STOCKPILE STEWARDSHIP

CORE STOCKPILE STEWARDSHIP

NOTE: Summary funding data is provided following the Weapons Stockpile Stewardship Program Mission Statement.

The Core Stockpile Stewardship Program supports the maintenance of a high level of confidence in the safety, reliability, and performance of the U.S. weapons stockpile in the absence of underground nuclear testing. The program provides the physical and intellectual infrastructure required to meet the programmatic requirements of the science-based Stockpile Stewardship program. Primary locations of activity are the Lawrence Livermore, Los Alamos and Sandia National Laboratories and the Nevada Test Site. The Stockpile Stewardship and Management Plan provides primary programmatic guidance.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Maintain a fully capable physical and intellectual infrastructure for the enduring stockpile;
- Maintain and enhance an effective stockpile surveillance and evaluation program, including preventive maintenance for the stockpile, to offset the lack of nuclear testing;
- Continue to provide and enhance the engineering and development capabilities, including computing and experimental simulation, required to refurbish and recertify the enduring stockpile;
- Maintain the capability to resume underground nuclear testing, if directed; and
- Retain the ability to develop and support the manufacturing of replacement designs.

SIGNIFICANT CHANGES FROM FY 1997:

- + \$ 49.5 million - Third year funding for the Accelerated Strategic Computing Initiative and ongoing computational requirements
- + \$ 10.6 million - Additional activities in direct support of the Stockpile
- + \$ 7.4 million - Full support of four subcritical experiments at the Nevada Test Site and the labs
- \$ 41.8 million - Decreased funding for ongoing Core Stockpile Stewardship Programs and Initiatives and Core Research and Advanced Technology activities
- \$ 88.3 million - Transfer of construction line items to the Defense Asset Acquisition account

BUDGET CONTENTS:

The Core Stockpile Stewardship program has five major funding categories:

- **PROGRAMS & INITIATIVES** supports direct stockpile activities and other discrete, high profile initiatives.
- **CORE RESEARCH & ADVANCED TECHNOLOGY** supports long-term science and technology required for an ongoing stockpile requirements response capability.
- **TESTING CAPABILITIES AND READINESS** ensures the continuing availability of the experimental and infrastructure capabilities of the Nevada Test Site as well as maintaining, per Presidential direction, a readiness to resume underground nuclear testing.
- **LABORATORY CAPITAL EQUIPMENT and GENERAL PLANT PROJECTS** supports the maintenance of the physical infrastructure of the laboratories.
- **CONSTRUCTION LINE ITEMS** provide line item funding for infrastructure and programmatic construction projects; beginning in FY 1998, these projects are located in the Defense Asset Acquisition account.

Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP**

PROGRAMS & INITIATIVES: Assures the ability to support the enduring stockpile; deals effectively with major redirection in the nuclear weapons research program resulting from the loss of ability to conduct underground nuclear tests; assures the ability to design safer weapons systems using a coordinated inter-laboratory approach; provides the technical expertise, equipment, and facilities that provide essential data in support of nuclear weapons research and development, and stockpile support missions; and provides technology supporting the nation's nonproliferation objectives. Programmatic Categories include: **DIRECT STOCKPILE ACTIVITIES, EXPERIMENTAL ACTIVITIES, ACCELERATED STRATEGIC COMPUTING INITIATIVE (ASCI),** and **SPECIAL PROJECTS.**

PROGRAM GOALS/ONGOING ACTIVITIES:

- Support the evaluation, maintenance, improvement, and dismantlement of the current and enduring nuclear weapons stockpile,
- Support the retention and acquisition of experimental data on all aspects of weapons components and technologies,
- Accelerate performance of computing systems to levels required to maintain the stockpile without underground nuclear testing, and
- Synergistically link the capabilities of the weapons program to the needs of the national security community.

CHANGE FROM FY 1997: Increase from FY 1997 supports the ongoing implementation of the ASCI program plan and activities in direct support of the stockpile.

FUNDING LEVELS:

\$322,083	\$383,262	\$438,739
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DIRECT STOCKPILE ACTIVITIES provide for preproduction design and engineering activities including initial design and development of all new weapon designs, if needed; the design and development of weapon modifications; the technical aspects of the laboratory surveillance and flight test program; the analysis behind safety studies and assessments; studies and research to apply basic science to weapon problems producing new technologies, products and processes; command and control and surety (safety, security, and use control) technology development and implementation; and the analysis needed to dismantle and safely store weapons being removed from the stockpile.

Programmatic Subcategories include: **Stockpile Readiness Program, Enduring Stockpile Program, Future Stockpile Program, and Stockpile Reduction Program.**

PROGRAM GOALS/ONGOING ACTIVITIES:

- Support the evaluation and maintenance of nuclear weapons in the active and inactive stockpile,
- Identify and respond to performance and safety issues associated with the stockpile,
- Ensure the availability of technologies required for the support of the enduring stockpile, and
- Ensure weapons dismantlements are timely, safe, and secure.

CHANGE FROM FY 1997: Increases from the FY 1997 program level include continued increases in performance of Nuclear Explosive Safety Studies/Seamless Safety 21 efforts, the Dual Revalidation program going into actual revalidation process, the advancement of the Submarine Launched Ballistic Missile (SLBM) Warhead Protection Program beyond the conceptual phase, and complete testing and development of the B61-11 project to replace the B53.

MEASURABLE PERFORMANCE ACTIVITIES (Summary of Direct Stockpile Activities Detail):

<u>FY 1996:</u> - Initiated work on the Submarine Launched Ballistic Missile (SLBM) Warhead Protection Program jointly with DoD to study efforts needed to ensure the reliable extension of the SLBM warheads service life and maintain the design team expertise and capability. - Continue development and testing of the B61-11. - Developed new modular architecture for use control equipment employed by the Cryptographic Theater Secure Recode System (CTSRS).	<u>FY 1997:</u> - Complete the B61-11 development and support delivery of B61-11 kits to the field. - Support Stockpile dismantlement. - Continue various Weapon System Safety Assessments. - Continue Pit Fire Resistance/Ceramic Coated Pits effort to evaluate environments and techniques useful to provide increased fire resistance in enduring stockpile weapons. - Complete Fire Resistance Enhancement Phase II.	<u>FY 1998:</u> - Support Stockpile dismantlement. - Complete processing of detonator surveillance for the W62, B83, W84, and W87 programs. - Complete development of the W76 ACORN. - Continue W87 ACORN development. - Continue nuclear certification of the B-2A Stealth Bomber.
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FUNDING LEVELS:

\$147,899	\$152,471	\$163,107
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CORE STOCKPILE STEWARDSHIP-PROGRAMS & INITIATIVES-Direct Stockpile Activities Summary

STOCKPILE READINESS PROGRAM focuses on the development efforts for all day-to-day activities supporting the evaluation and maintenance of nuclear weapons in the active and inactive stockpile. The range of activities include analysis and technical support during production, assembly, and dismantlement; surveillance testing (both laboratory and flight); required safety assessments; development of weapon-specific technologies, products and processes needed by the production complex to enhance the surveillance process; and liaison activities with the Department of Defense such as the Project Officers Groups and the Nuclear Weapons Council. These liaison activities are primarily devoted to safety studies mandated by external agencies. Annual activities include Nuclear Explosive Safety Studies, Weapon Appraisal Process, Weapons System Safety Assessments, and Nuclear Weapon Safety Studies.

MEASURABLE PERFORMANCE ACTIVITIES (Direct Stockpile Activities/Stockpile Readiness Program Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Completed a number of projects supporting surety studies such as: Nuclear Explosive Safety Studies, Weapon Appraisal Process, Weapons System Safety Assessments and Nuclear Weapons Safety Studies. - Initiated development and evaluation of enhanced diagnostic techniques for characterization of aging effects in stockpile systems and began characterization for predictive models. - Developed new modular architecture for use control equipment employed by the Cryptographic Theater Secure Recode System (CTSRS). - Initiated Dual Revalidation of the W76. - Performed Aircraft Compatibility Tests. - Completed a portion of the nuclear certification of the B-2A Stealth Bomber. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Continue development of a new Boost system. - Continue projects supporting surety studies such as: Nuclear Explosive Safety Studies, Annual Certification, and Weapon System Safety Assessments. - Continue Dual Revalidation of the W76. - Continue development of the Cryptographic Theater Secure Recode System (CTSRS). - Complete the B52H study. - Complete Fire Resistance Enhancement Phase II. - Continue aircraft compatibility testing. - Continue nuclear certification of the B-2A Stealth Bomber. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Continue projects supporting surety studies such as: Nuclear Explosive Safety Studies, Annual Certification, and Weapon System Safety Assessments. - Continue development of a new Boost system. - Continue development of the Cryptographic Theater Secure Recode System (CTSRS). - Complete processing of detonator surveillance for the W62, B83, W84, and W87 programs. - Continue Dual Revalidation of the W76. - Continue development of the T1565A Headquarters Processor replacement. - Certify new computers on aircraft with the B61-3, 4 and 10 weapons. - Complete a portion of the nuclear certification of the B-2A Stealth Bomber.

FUNDING LEVELS:

\$39,024	\$40,395	\$41,226
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Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP - Programs & Initiatives**
DIRECT STOCKPILE ACTIVITIES

ENDURING STOCKPILE PROGRAM is focused in two areas. "Stockpile Improvements" support sanctioned weapon direct stockpile activities intended to go into a production phase. "Stockpile Options" support more generalized weapons-specific technology explorations to form a basis for later stockpile improvement programs or provide proof of concept for further development. Currently, programs are focused on extending the lifespan of the weapons planned for the enduring stockpile, or in the case of the B53, modifying a current weapon to be a suitable replacement when the B53 is withdrawn from service.

MEASURABLE PERFORMANCE ACTIVITIES (Direct Stockpile Activities/Enduring Stockpile Program Details):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Continued the Enhanced Surety Study. - Established requirements and design specifications for the B61-11 to include the Military Characteristics and the Stockpile to Target Sequence. - Initiated work on the Submarine Launched Ballistic Missile (SLBM) Warhead Protection Program jointly with DoD to study efforts needed to ensure the reliable extension of the SLBM warheads service life and maintain the design team expertise and capability. - Continued development of the W76 ACORN. - Continued the W87 Life Extension Program. - Initiated development of Permissive Action Link (PAL) control equipment upgrades and modernization. - Completed STRATCOM Secure Recode System CAT-F PAL upgrade feasibility studies. - Initiated Advanced Micro-electronic Project. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Continue work on the SLBM Warhead Protection Program to include feasibility of new pit option, pit reuse option and finalize design of advanced Arming and Fuzing module. - Continue development of B61-3, 4 and 10 stockpile upgrade. - Complete the B61-11 development and support delivery of B61-11 kits to the field. - Continue development of the replacement W76 Neutron Generator. - Continue development of the W87 Life Extension Program to maintain viability of stockpile weapons. - Continue development of PAL control equipment upgrades and modernization. - Initiate development of radiation-hardened non-volatile memory technology to provide the weapons program access to a critical technology. - Continue Advanced Micro-electronic Project. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Continue work on the SLBM Warhead Protection Program to include completion of definition of the new pit option, and fabricate and test the advanced Arming and Fuzing hardware modules. Program completion is scheduled for FY 2004. - Continue development of B61-3, 4 and 10 stockpile upgrade. - Continue W87 ACORN development. - Begin design of a crypto PAL capability for the remainder of the B61 family and the W80. - Complete development of the W76 ACORN. - Continue development of radiation-hardened non-volatile memory technology to provide the weapons program access to a critical technology.
<i>FUNDING LEVELS:</i>		
\$76,823	\$83,806	\$90,869

Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP - Programs & Initiatives**
DIRECT STOCKPILE ACTIVITIES

FUTURE STOCKPILE PROGRAM supports weapon research into enhanced surety and future technologies. Enhanced surety is focused on the development and implementation of technologies to improve safety, security, and use control. Future technology activities are directed at the development of new processes or technologies to improve reliability, performance, or other aspects of the weapons to extend their serviceability. New, more secure, and less sensitive firesets are one of the principal areas of investigation.

MEASURABLE PERFORMANCE ACTIVITIES (Direct Stockpile Activities/Future Stockpile Program Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Pursued advanced safety and use control technologies. - Continued the Pit Fire Resistance/Ceramic Coated Pits effort to evaluate environments and techniques useful to provide increased fire resistance in enduring stockpile weapons. - Initiated the advanced detonation system. - Continued development of Advanced Firing and Detonator. - Completed the first part of a three-part Self-Aware Weapon Study of the utility and projected benefits of installing sensors in weapons to detect and report environmental variables. Information would be used to develop prediction models of "aging" weapon performance. - Provided coded control enhancements and initiated a study of coded control options for the B52. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Continue to study detonation systems which provide the design, engineering and development of new technologies which would be used as safety improvements in the enduring stockpile. - Continue development of Advanced Firing and Detonator. - Continue the Pit Fire Resistance/Ceramic Coated Pits effort to evaluate environments and techniques useful to provide increased fire resistance in enduring stockpile weapons. - Evaluate surety and cost benefits for alternate technologies for enhancing surety in the enduring stockpile. - Continue the study on coded control options for the B52. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Continue development of technologies required for an earth penetrator weapon. - Continue development of Advanced Firing and Detonator. - Continue development of a Crypto Coded Permissive Action Link due to fading sunset technology. - Continue the Pit Fire Resistance effort to evaluate environments and techniques useful to provide increased fire resistance in enduring stockpile weapons. - Provide follow-on support as required to USAF, Navy Staff and program offices to enhance use control of enduring nuclear weapon systems.
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FUNDING LEVELS:

\$18,054	\$16,460	\$18,068
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Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP - Programs & Initiatives**
DIRECT STOCKPILE ACTIVITIES

STOCKPILE REDUCTION PROGRAM provides laboratory support for the timely, safe, and secure disassembly of U. S. weapons. The retirement of large numbers of older stockpile weapon systems has led to an increased emphasis on compliance with current environmental, safety and health requirements and to the design of disassembly processes and tooling to meet modern safety standards. The laboratories provide support for the disposal and storage efforts at Pantex and Y-12 and provide development of advanced technologies to improve dismantlement operations.

MEASURABLE PERFORMANCE ACTIVITIES (Direct Stockpile Activities/Stockpile Reduction Program Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Continued to evaluate the prototype Straight Line storage monitoring system at Pantex Plant. Evaluation led to an emplaced enhancement at Pantex. - Completed the Integrated Nuclear Materials Monitor (INMM) project plan to develop a multi-purpose sensor suite capable of monitoring different properties associated with nuclear materials. -Delivered three W79 high explosives dissolution workstations. - Continued the W79 capping project which allowed them to be ready for dismantlement. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Continue AT-400A pit storage container development support for dismantlement schedule. - Use the INMM project plan to support development of application to monitor different properties associated with nuclear materials. - Continue evaluation of the Straight Line system. - Develop and demonstrate the components of a stored nuclear material monitoring system. - Continue to support stockpile dismantlement. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Continue development of INMM applications. - Continue development and demonstrate the components of a stored nuclear material monitoring system. - Continue to support stockpile dismantlement. - Expand the Straight Line system to be able to monitor more than one site.
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FUNDING LEVELS:

\$13,998	\$11,810	\$12,944
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EXPERIMENTAL ACTIVITIES provides data to maintain certification of the current stockpile through experiments using high explosives and may use small quantities of special nuclear material. Experiments are conducted at the national laboratories and at the Nevada Test Site and directly support Presidential direction to maintain the ability to conduct an underground nuclear test at the Nevada Test Site. Funding for the Nevada Test Site contractors who support these experiments is included in the **Testing Capabilities and Readiness** budget category. Programmatic Subcategories include: **Archiving, Nuclear Component Assessment, and Nonnuclear Component Assessment.**

PROGRAM GOALS/ONGOING ACTIVITIES:

- Identify, analyze, and archive critical information on weapons design, testing and production from retiring laboratory and Nevada Test Site personnel,
- Support the acquisition of new experimental data on the physics of nuclear components to allow certification of those components,
- Experimentally test nonnuclear components to insure their ability to withstand high levels of radiation experienced during the life cycle of a nuclear weapon.

CHANGE FROM FY 1997: Increase from FY 1997 supports ongoing level of effort and laboratory activities associated with subcritical experiments.

MEASURABLE PERFORMANCE ACTIVITIES (Summary of Experimental Activities Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Applied Livermore Archiving Mosaic Platform (LAMP) to test operation technologies as the archiving medium for LLNL, the Joint Testing Organization, and DOE/NV archiving programs. - Completed 3 year effort to transfer NTS seismic data from magnetic tapes to modern formats. - W87 Life Extension Program will continue with major effort to rework and modernize the W87 modeling processes with improved physics and complete material definition. Effort will continue into FY 1997. - Developed and implemented thermal acceleration/low dose rate testing facility for B61 Stockpile Obligations Program. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Support laboratory activities for two subcritical experiments at NTS. - Continue to evaluate with modern calculation tools nuclear weapons information from nuclear tests and hydrodynamic experiments. - Continue to update W62 models with modern design tools, and begin the reanalysis of past nuclear tests. - Conduct hydrodynamic experiments to obtain baseline data for stockpile system primaries including W76 and W80. - Conduct experiments in z-pinch physics on the modified Particle Beam Fusion Accelerator (PBFA-IIZ). Experiments with advanced pulsed power technologies will continue to enable validation of hot plasma scaling laws, conduct key source development research, and develop the engineering necessary to store and transport required energy levels for future applications. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Support laboratory activities for four subcritical experiments at NTS. - Knowledge Preservation Interviews will utilize videotaped sessions in individual or panel settings with associated reference materials, incorporating emerging technologies for searching and browsing these video interviews to greatly increase the accessibility to this knowledge base. - Continue studies on the equation of state of plutonium, and on obtaining experimental data to help understand differences between war reserve pits made at Rocky Flats and those that will be produced at TA-55 to replace those taken from the stockpile for destructive surveillance. - Examine rapid annealing of neutron damage in newer technology piece parts such as polysilicon emitter transistors.
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FUNDING LEVELS:

\$35,729	\$40,765	\$52,736
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CORE STOCKPILE STEWARDSHIP-PROGRAMS & INITIATIVES-Experimental Activities Summary

Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP - Programs & Initiatives**
EXPERIMENTAL ACTIVITIES

ARCHIVING: Identifies and preserves information on stockpile weapon design parameters, production and engineering data, and data from nuclear and nonnuclear tests in order to facilitate certification of the current stockpile weapons. Many activities focus on identification, analysis, and archiving of information from retiring weapon designers, production specialists, and computational model specialists. This information and data are preserved and used for analysis of current stockpile weapons and their effects; support of proliferation analysis; critical information for emergency response; training future scientists, engineers, and technicians; and preserving information for reconstitution.

MEASURABLE PERFORMANCE ACTIVITIES (*Experimental Activities/Archiving Detail*):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Retrieved, reviewed and documented engineering and test methods and data for all operational and technical areas involved in past underground nuclear testing and nonnuclear tests. - Continued efforts in the design of a demonstration system for a prototype retrieval/display utility for textual and graphical information. - Applied Livermore Archiving Mosaic Platform (LAMP) to test operation technologies as the archiving medium for LLNL, the Joint Testing Organization, and DOE/NV archiving programs. - Completed 3 year effort to transfer NTS seismic data from magnetic tapes to modern formats. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Capture and document, in a usable form, NTS contractor engineering and underground test methods and data for all operational, safety, and technical areas involved in past underground nuclear testing. - Capture and document, in a usable form, weapons design information for the purpose of recertification, dual revalidation, and the life extension program. - Continue to evaluate with modern calculation tools nuclear weapons information from nuclear tests and hydrodynamic experiments. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Continue collaborative weapons archiving effort known as the Nuclear Weapons Information Group (NWIG) to ensure complete coverage, compatibility, and leveraging of efforts and resources. - Critical archival material will be identified by consulting with subject matter experts, through the process of addressing stockpile issues, or revisiting stockpile designs, technologies, data, and operational processes. Where practical, the identified material will be captured in standard electronic formats. Content will be added as resources for electronic capture permit, with a focus on data and information at risk. The archiving product will be integrated to the extent possible into the routine of working scientists and engineers. - Knowledge Preservation Interviews will utilize videotaped sessions in individual or panel settings with associated reference materials, incorporating emerging technologies for searching and browsing these video interviews to greatly increase the accessibility to this knowledge base.
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FUNDING LEVELS:

\$8,505	\$13,255	\$13,448
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Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP - Programs & Initiatives**
EXPERIMENTAL ACTIVITIES

NUCLEAR COMPONENT ASSESSMENT: The performance of modern nuclear weapons depends on complex physical phenomena, many of which are incompletely understood. Underground nuclear testing established the experimental basis for improved understanding of the physics occurring within a nuclear weapon. Data obtained from experiments in underground tests were used to benchmark computer codes. With the moratorium on underground nuclear testing, scientists and engineers are working on experiments using hydrodynamic techniques, with and without special nuclear material, to assess a limited dimension of physical phenomena. These experiments allow laboratory personnel to compare experimental data with data from prior underground nuclear tests in order to validate or modify computational codes. This experimental process involves stockpile nuclear components, diagnostic instrumentation, analysis, and fielding and is vital to maintaining expertise to certify the nuclear stockpile. These experiments are also important to learn more about the nuclear stockpile as it ages past its originally intended lifetime.

MEASURABLE PERFORMANCE ACTIVITIES (*Experimental Activities/Nuclear Component Assessment Detail*):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Continued W87 Life Extension Program with major effort to rework and modernize the W87 modeling processes with improved physics and complete material definition. Effort will continue into FY 1997. - Conducted Hydrodynamic experiments to obtain data for stockpile system primaries including W76, W80, W84, and W89, and to evaluate safety upgrade options for stockpile system primaries. - Prepared for first subcritical experiment, REBOUND, to be conducted at the Nevada Test Site during first part of FY 1997. Participated in pre-REBOUND tests at LANL and in MONARCH dry runs at NTS. - Continued to improve the baseline for W84 primary. Completed and documented post test analysis of two core punch hydrodynamic tests. - Procured a limited number of long-life field test neutron generators. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Continue work on dynamic properties of plutonium. This will involve fielding the experiments REBOUND and HOLOG and analyzing the data. - Continue to develop shot design to evaluate a radiographic capability to measure mix in an imploded gas cavity using known amounts of high density mix. - Continue to update W62 models with modern design tools, and begin the reanalysis of past nuclear tests. - Conduct hydrodynamic experiments to obtain baseline data for stockpile system primaries including W76 and W80. - Conduct hydrodynamic experiments on a W76 using aged components to investigate possible effects of aging on system performance. - Complete development for double pulsed PHERMEX to supply increased radiographic information on hydrodynamic experiments. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Support laboratory activities on four subcritical experiments at NTS. - Continue studies on the equation of state of plutonium, and on obtaining experimental data to help understand differences between war reserve pits made at Rocky Flats and those that will be produced at TA-55 to replace those taken from the stockpile for destructive surveillance. - Continue to improve the baseline for the W76, B61, W78, and W80 with hydrodynamic tests in late FY 1998. - Design, test and analyze a B53 core punch and the results with previous nuclear and hydrodynamic tests. - Continue with Fabry-Perot hydrodynamic series to evaluate the W87, W84, and B83 as needed.
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FUNDING LEVELS:

\$22,624	\$21,450	\$33,857
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Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP - Programs & Initiatives**
EXPERIMENTAL ACTIVITIES

NONNUCLEAR COMPONENT ASSESSMENT: Aboveground experiments are used to assess and certify nonnuclear stockpile weapon subsystems and component hardware to the effects of neutron, x-ray and gamma-radiation. Radiation simulator data is applied to understand electronic and material responses and enhance protocols for testing, analysis and certification of components, subsystems, and systems. Experiments with high-energy density plasmas provide basic hohlraum temperature versus scaling law validation and x-ray data that support development of advanced simulation capability critical to future certification efforts of nonnuclear components.

MEASURABLE PERFORMANCE ACTIVITIES (Experimental Activities/Nonnuclear Component Assessment Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Procured hardware and planned surveillance testing for W76 associated electronic hardware. - Conducted studies of electronics exposed to low level radiation for long times. - Completed radiation effects experimentation for advanced development electronic components. - Developed and implemented thermal acceleration/low dose rate testing facility for B61 Stockpile Obligations Program. - Processed GaAs Wafers and CMOS parts with SPR reactor. - Completed modification of the Particle Beam Fusion Accelerator (PBFA-II) and continued advanced pulsed power experiments. Initiated z-pinch experiments which are expected to be completed in FY 1997 to validate the hot plasma scaling laws, conduct key source development research, and develop the engineering necessary to transport required energy levels along a magnetically insulated transmission line. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Conduct pulsed power, reactor and gamma ray electronics and materials tests in support of the Weapons Protection Program, Dual Revalidation, Enhanced Surveillance and other programs. - Maintain radiation metrology and test fidelity capabilities to certify radiation hardness of components and systems. - Perform ACORN gas storage system tests. - Test fireset trigger circuits to examine damage and rapid annealing dependence on aging. - Conduct experiments in z-pinch physics on the modified Particle Beam Fusion Accelerator (PBFA-II). Continue experiments with advanced pulsed power technologies, enabling validation of hot plasma scaling laws, conduct key source development research, and develop and establish the engineering necessary to store and transport required energy levels for future applications. - Conduct studies of electronics exposed to low level radiation for long times. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Conduct pulsed power, reactor and gamma ray electronics and materials tests in support of the Weapons Protection Program, Dual Revalidation, Enhanced Surveillance and other programs. - Maintain radiation metrology and test fidelity capabilities to certify radiation hardness of components and systems. - Examine rapid annealing of neutron damage in newer technology piece parts such as polysilicon emitter transistors. - Understand neutron spectrum and other dependencies of neutron-induced single event upset. - Conduct studies of electronics exposed to low level radiation for long times.
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FUNDING LEVELS:

\$4,600	\$6,060	\$5,431
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CORE STOCKPILE STEWARDSHIP-PROGRAMS & INITIATIVES-Experimental Activities Detail (3 of 3)

ACCELERATED STRATEGIC COMPUTING INITIATIVE: ASCI is a 15 year program (FY 1996 - 2010) supporting Defense Programs' response to the Presidential decision to pursue a zero yield Comprehensive Test Ban Treaty. ASCI is a balanced program to accelerate the development of simulation codes, computer platforms and computing environments needed to address the challenges of credibly simulating the performance, safety, and reliability of the enduring nuclear stockpile. ASCI works closely with U.S. industry to accelerate its plans to provide computer systems far exceeding current industry projections, but essential to Stockpile Stewardship. ASCI will engage U.S. universities on critical simulation capability problems addressing physics, materials modeling, and computer science issues. ASCI builds on and accelerates efforts found in the Computations and Modeling program.

PROGRAM GOALS/ONGOING ACTIVITIES: Create 3-D, full-systems virtual testing and prototyping ability based on advanced weapon codes and high performance computing. Develop a credible path to allow confidence in the abilities of computers to simulate "real world" events. Work with the computing and software industry to accelerate performance and storage trends in computing systems. Provide the needed ability to analyze, evaluate, maintain, and prototype nuclear weapons and weapons components. **PROGRAM STRATEGIES:** One- Program/Three- Laboratories; Advanced Applications Development; Platforms; Problem-Solving Environments, and Strategic Alliances and Collaborations. The ASCI Program Goals and Strategies are discussed in detail in the *ASCI Program Plan*.

CHANGE FROM FY 1997: The program will (1) provide immediate additional physics, engineering, model fidelity and geometric accuracy for key device sequences where no laboratory testing exists; (2) leverage the substantial performance achievements in hardware development; (3) increase funding at universities to accelerate development of new physics and mathematics for review and validation; (4) continue industry work in simulation technologies; (5) aggregate off-the-shelf technology into architecture to develop economical high performance computing; and (6) initiate the 10-TeraOps computer procurement.

MEASURABLE PERFORMANCE ACTIVITIES (*Summary of ASCI Detail*):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Completed the design, development, and testing of the computer nodes of the 1.8 TeraOps ASCI-RED computer. Five nodes of the final system were delivered to Sandia National Laboratories, in February 1996 for system software development, followed by the installation of a 64 node, 20 GigaOps predelivery system for early system and application testing and code development. - Established effort for explosion codes which treat high and low energy density physics in a coupled way and with high fidelity and 3-D geometries. - Delivered prototype 3-D parallel safety/manufacturing code ported to ASCI-RED machine. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - ASCI RED: Vendor will demonstrate 200 GigaOps performance at Sandia National Laboratories. The vendor successfully demonstrated 1 trillion floating operations per second in December 1996. Full 1.8 TeraOps performance will be demonstrated on-site early in calendar year 1997. ASCI codes will be operational on the machine by the end of FY 1997. - Deliver initial development systems of the ASCI-BLUE platforms to LANL and LLNL. - Implement safety models for fireset response and crash on the ASCI-RED hardware and perform calculations of the W76 fireset thermal response and C-130 wing and full aircraft crash. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Operate the ASCI RED TeraOps machine in full production mode running applications for the weapons program. - Deliver three-TeraOps ASCI -BLUE platforms. - Develop graphics/visualization software to handle large datasets (approaching 100 gigabytes) and stereo viewing. Provide prototype Scientific Data Management system capable of handling very large data sets. - Implement initial safety models for violence of reaction and electrical threat on the ASCI-RED machine and perform prototype safety calculations.
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FUNDING LEVELS:

\$85,515	\$151,615	\$204,800
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CORE STOCKPILE STEWARDSHIP-PROGRAMS & INITIATIVES-Accelerated Strategic Computing Initiative Summary

ADVANCED APPLICATIONS: Progressively higher-performance ASCI applications codes will provide a virtual test capability that is the key to achieving the science-based Stockpile Stewardship objectives outlined for 2010. The applications codes will provide the weapons analyst a "virtual test" capability as a means of developing a fundamental understanding of weapon system performance. ASCI has three main thrusts for advanced applications development: 1) Produce full-system, full-physics, 3-D simulations to allow the simulation of the entire "stockpile-to-target" sequence including efficient design of environmentally acceptable manufacturing processes, 2) Rigorously validate simulations with experiments and archival data to allow weapons designers and analysts to use the codes with confidence in their reliability, and 3) Accelerate code performance to maximize the performance of specific applications on specific architectures.

MEASURABLE PERFORMANCE ACTIVITIES (ASCI/Advanced Applications Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Completed the requirements definition and documentation for the SIERRA code development effort. SIERRA is a massively parallel coupled mechanics code that will support a wide range of applications in weapon safety, aging, and manufacturing. - Implemented CTH and ALEGRA codes on the initial hardware delivery (20 GigaOps) of the ASCI RED machine. This provided critical testing and debugging of the operating system and software environment to insure rapid utilization of the full RED machine early in FY 1997. - Demonstrated a 10X better virtual testing capability in safety and hydro code algorithms for massively parallel computers. - Implemented a realistic interatomic force model in molecular dynamics codes preparatory to carrying out very accurate, very large-scale parallel calculations of material behavior. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Use the advanced software development environment, SIERRA, to prototype versions of COYOTE, JAS, and GOMA for the ASCI-RED machine. Produce prototype parallel algorithms for a fire simulation code and an operating architecture for coupled thermal/mechanical calculations. - Initiate development and testing of massively parallel models for re-entry body structural response, laydown, and parachute performance. - Implement initial safety models for fireset response and crash on the ASCI-RED hardware and perform prototype calculations of the W76 fireset thermal response. - Prototype 3-D Stockpile Life Extension Program secondary yield assessment. 	<p><u>FY 1998</u></p> <ul style="list-style-type: none"> - Implement a coupled physics platform, coupling thermal/chemistry/quasi-static technology, transient dynamics/fluid technology, thermal/chemistry/fluid technology, and thermal/chemistry quasi-static technology on SIERRA. - Develop and implement 3D nonlinear geometrical and material damping models for laydown simulation, electronic device models for electrical system performance simulation, multi-scale physics models for the advanced electromagnetic (EM) code and integrate time-domain and frequency-domain tools into the advanced EM toolset. - Proceed with explosive aging simulation with micro- and macro-scale chemical migration and decomposition models.
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FUNDING LEVELS:

\$32,500	\$75,050	\$107,365
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Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP** - *Programs & Initiatives*
ACCELERATED STRATEGIC COMPUTING INITIATIVE

PLATFORMS: ASCI applications will require a five-order-of-magnitude increase in computing performance above the sustained 50+ millions-of-operations-per-second currently provided by high-end commercial technology. In order to support "full-physics," "full system" simulation, ultimately hundreds of trillions-of-operations per second are required. The ASCI platform effort will bridge the gap between giga-scale and tera-scale computing through four main thrusts: 1) accelerate high-performance computing through multiple partnerships, 2) develop software to take full advantage of hardware capabilities, 3) maintain affordability by accelerating existing industry technology trends; and 4) provide balanced 100 trillions- of-operations-per-second computing platforms by 2003/4.

MEASURABLE PERFORMANCE ACTIVITIES (ASCI/Platforms Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Complete design, development, and testing of the computer nodes of the 1.8 TeraOps ASCI-RED computer. Five nodes of the final system were delivered to Sandia National Laboratories, Albuquerque in February 1996 for system software development, followed by the installation in April 1996 of a 64 node, 20 GigaOps predelivery system for early system and application testing and code development. - Massively parallel versions of codes from Lawrence Livermore, Los Alamos and Sandia National Laboratories were ported to the 64 node system in anticipation of the full system delivery. - Selected vendors for the two Option Blue, three-TeraOp platform hardware research and development contracts. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - ASCI-RED: Early in the fiscal year, the commercial vendor, Intel, will demonstrate 200 GigaOps performance at Sandia National Laboratories, Albuquerque. Full 1.8 TeraOps performance will be demonstrated on-site early in calendar year 1997. ASCI codes will be operational on the TeraOps machine, performing useful calculations, by the end of FY 1997. - Initial development system of the ASCI-BLUE platform at Lawrence Livermore National Laboratory will be available for use with 512 node SP2 split into two 256 node systems, one for classified use and one for unclassified work. - Initial development system of 100 GigaOps of the ASCI-BLUE platform will be installed at Los Alamos Laboratory . 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - The ASCI-RED TeraOps machine will be in full production mode running applications for the weapons program. - Deliver the three TeraOps ASCI-BLUE platforms in fully functional mode to the Los Alamos and Lawrence Livermore National Laboratories with the full systems delivered by end of calendar year 1998.
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FUNDING LEVELS:

\$31,500	\$37,500	\$37,380
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PROBLEM SOLVING ENVIRONMENTS: The success of ASCI depends on the rapid development of a new generation of weapons simulation codes and their application to the challenges of stockpile stewardship and management. The key players in these activities are the application developers and the weapon scientists. The fundamental goal of ASCI's Problem Solving Environments strategy is to give these two groups the tools they need by supporting the rapid development of predictive weapon simulation codes that are adapted for the efficient use of very large-scale parallel computers, and ensuring that the power of the application/platform combination can be readily applied by our weapon scientists to the challenges of stockpile stewardship and management. The Problem Solving Environments strategy has four main thrusts: supporting code development for advanced weapon applications, supporting weapon application execution on ASCI computing platforms, ensuring that simulation results are accessible and understandable, and providing a unified computing and information environment capable of supporting the Stockpile Stewardship and Management Program.

MEASURABLE PERFORMANCE ACTIVITIES (ASCI/Problem Solving Environments):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Established SecureNet between Lawrence Livermore, Los Alamos, and Sandia National Laboratories and began extending net to production complex sites. - Established collaboration to demonstrate distributed computing framework. - Instituted first phase of Tri-lab unified information management environment. - Deployed first version of the High-Performance Storage System (HPSS). - Prototyped an OC-12 I/O interface for interconnecting the ASCI-RED computer and the HPSS. - Initiated advanced Visualization Server project to provide end-to-end visualization of very large data sets. - Integrated initial delivery of ASCI-BLUE system into LLNL computing infrastructure. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Improve performance of SecureNet connecting the three DP labs enhancing the high speed connection to 45 megabytes per second and providing advanced services, e.g., X-Windows graphical interface. - Define the application user's visualization tool(s) for ASCI-RED and BLUE. Partner with SIERRA and ALEGRA teams to define data representation for visualization. Deploy and test the advanced Visualization Server and extend to users at remote sites. - Develop and deploy version 3 of the High Performance Storage System in the unclassified/classified mode for ASCI-RED. - Develop advanced encryptors in partnership with the National Security Agency. - Continue effort of run-time parallel rendering for visualization of 3D code results. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Increase the connection speed of SecureNet to 155 megabytes per second. - Enhance Common Basic Environment functional specification and user guide. - Deploy Message Passing Interface 2 (MPI2) on ASCI platforms. - Provide production quality parallel application development environment on ASCI-BLUE platform at Lawrence Livermore National Laboratory. - Develop and deploy version 4 HPSS in unclassified/classified mode for ASCI-RED. - Provide transparent access to data and files regardless of physical location using Global File System based on DFS and HPSS technology. - Develop parallel encryption schemes for high speed networks and protocols for Gbps-Tbps networks.
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FUNDING LEVELS:

\$15,500	\$23,950	\$37,055
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STRATEGIC ALLIANCES AND COLLABORATIONS: The shift to high-performance computing and science as the basis for confidence in the stockpile poses complex theoretical and practical problems in computer science and the physical sciences that are worthy of study by the best and most creative minds of the Nation. Engaging the efforts of individuals and groups at universities, other government agencies, and industry through strategic alliances and investigations will be critical to the success of ASCI. There will be three parts to this effort. 1) The bulk of the Alliances strategy effort will be to form long-term strategic alliances with a small number of research universities and academic consortia to develop critical mass efforts dedicated to long-term ASCI issues, such as high-confidence simulations. 2) The Alliances strategy will also include smaller scale investigations with individual investigators and research groups to work on more narrowly focused problems. 3) Task-oriented collaborations will be closely linked with specific ASCI deliverables and sponsored by laboratory research group managers in order to work on specific ASCI issues.

MEASURABLE PERFORMANCE ACTIVITIES (ASCI/Strategic Alliances and Investigations Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> -Initiated or proposed projects for strategic alliances and investigations. Areas of potential research include scalable I/O; development of balanced, scalable, end-to-end I/O environment, prototype high performance SMP Cluster for advanced scientific computing, multiscale materials modeling for plastic flow in body-centered-cubic metals, and programming support for Shared Memory Clusters of Processors. - Several strategic investigation projects with universities and industry were underway and achieving successful results, including implementation of an alloy solidification model in the TELLURIDE code; Adaptive Mesh Refinement (AMR) for detonation and shock wave simulation; massively parallelizing and distributing visualization process onto workstations and deformation of materials in high-stress regimes. - Initiated development of the Program Announcement for FY97 strategic alliance and investigation projects with universities and industry. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Efforts will proceed to execute the Program Announcement to solicit for proposals to create ASCI Strategic Alliance Centers of Excellence at competitively selected universities by the end of Q2/FY97. Furthermore, new FY97 strategic collaborations with individual university and industry researchers to work on more focused ASCI problems will be initiated and sustained. - Continue work on existing FY96 investigation projects. - Hold annual review to monitor technical progress of all ongoing strategic investigation projects. - Initiate development of Program Announcement to solicit for additional ASCI Strategic Alliance Centers of Excellence, if deemed necessary, to be established in FY98. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> -Efforts to review proposals and select additional universities, if deemed needed, to be ASCI Strategic Alliance Centers of Excellence will be undertaken. - Continue work on existing alliance and investigation projects. - Hold annual technical reviews to measure performance progress of ongoing alliance and investigation works. - Prepare and initiate solicitation process to call for new proposals for additional strategic investigation projects to be selected in early FY99.
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FUNDING LEVELS:

\$5,000	\$8,000	\$14,500
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Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP - Programs & Initiatives**
ACCELERATED STRATEGIC COMPUTING INITIATIVE

ONE PROGRAM / THREE LABS ACTIVITIES: This strategy helps to create seamless management by providing ASCI program reviews and publications, and for other activities which encourage and facilitate three-lab interactions to leverage all available capabilities which might positively impact the ASCI program. The problems that ASCI will solve for science-based Stockpile Stewardship span the activities and responsibilities of the three DP laboratories (Los Alamos, Sandia and Lawrence Livermore), and their solutions will require unprecedented cooperation. The entire team must operate ASCI as a single, 3-laboratory program activity with seamless management and execution; collaborate on development and share hardware and software resources; take maximum advantage of standard tools, common system structures, and code portability to enable inter-laboratory collaboration; and communicate their activities / problems with one another, both inter- and intra-lab. One Program/ Three Laboratories activities span the program and cross-cut the ASCI strategies. They fall into several categories including: periodic review meetings; reporting and outreach publications (original and updates); professional workshops to gather opinions from the widest possible range of experts on ASCI-related problems and topics of interest; and workshops to facilitate potential R&D collaborations between industry and the national labs.

MEASURABLE PERFORMANCE ACTIVITIES (ASCI/One Program/Three Labs Activities Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Semiannual Principal Investigator (PI) Meetings: Planned and conducted the 2 PI meetings in November 1995 and May 1996 to review the overall technical progress of the ASCI program. - ASCI Simulations Development Roadmap: developed and continually revised drafts of classified document that describes the many underlying sciences required for weapons simulations and modeling. Effort to produce unclassified version of roadmap was initiated. - ASCI Implementation Plans (IPs): Held IP meeting at end of July 1996 to coordinate and integrate the 5 ASCI strategies' FY97 IPs which fully describe all ASCI funded activities planned for FY 1997. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Review overall progress of the ASCI program by holding the fall and spring <i>PI Meetings</i>. - Update <i>ASCI Simulations Development Roadmap</i>. - Generate and publish <i>FY1998 ASCI Implementation Plans</i> 5 strategies. -<i>Technical Workshops</i>- Plan\conduct workshops to discuss common technical problems or topics of interests identified by the labs with technical experts from industry, universities, etc. -<i>Industry Sector Collaborative Workshops</i>- Plan\conduct workshops with experts and representatives from industry sectors (e.g. petroleum, automotive, biomedical) to explore possible modeling- and simulation-related R&D collaborations between industries and DP labs. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Review program progress at the fall and spring <i>PI Meetings</i>. - Continue to update and refine <i>ASCI Program Plan</i> for FY 98/99. - Update <i>ASCI Simulations Development Roadmap</i>, both in classified and unclassified versions. - <i>Technical Workshops</i>- Evaluate and improve workshops to discuss problems and topics of interest to the labs with technical experts from industry, universities, etc. - <i>Industry Sector Collaborative Workshops</i>- Expand workshops with experts and representatives from other industry sectors such as computer, chemical, and pharmaceutical to explore possible modeling- and simulation-related R&D collaborations.
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FUNDING LEVELS:

\$1,015	\$7,115	\$8,500
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SPECIAL PROJECTS: This budget category provides for unique miscellaneous research and development and support activities necessary to carry out the weapons Stockpile Stewardship program, but which do not programmatically fit into any other category. Programmatic Subcategories include: **Weapons Transportation Safeguards Systems, Extraordinary ES&H Site Remediation, Joint DoD/DOE Munitions Technology Development Program, and Other Activities.**

PROGRAM GOALS/ONGOING ACTIVITIES:

- Develop and prototype the SafeGuards Transporter for ground transportation of weapons and special nuclear materials,
- Complete one-time prioritized environmental corrective actions, particularly the Propellants, Explosives, and Pyrotechnics Evaluation and Reapplications (PEPER) project at SNL and the cleanup of the Tritium Research Laboratory (TRL) at SNL,
- Cooperate with DoD on R&D in areas of mutual interest including energetic materials, electronics, and warhead technology,

CHANGE FROM FY 1997: Change from FY 1997 reflects completion of extraordinary ES&H activities at Sandia National Laboratories.

MEASURABLE PERFORMANCE ACTIVITIES (Summary of Special Projects Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Completed Safeguards Transporter prototype in December 1995 establishing preliminary production capabilities at Allied Signal/FM&T and providing a vehicle to be used for system validation. - Reclassified the Tritium Research Laboratory to a radiological facility after a complete verification and radiological characterization. Initiated final stack monitoring with expectation that stack monitoring will be completed in FY 1997 after fulfilling requirements of agreement among SNL, EPA, and DOE. - Provided first successful measurement of shocked metal surface temperature using infrared detector array and optics system. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Complete TRL stack monitoring. - Begin the Lawrence Livermore effort to "re-can" stored plutonium to modern canisters per Defense Nuclear Facilities Safety Board recommendation 94-1. A similar ongoing Defense Programs effort at Los Alamos National Laboratory is being funded in the Weapons Stockpile Management decision unit. - Employ infrared detector array for temperature measurement on a variety of shocked metal surfaces, including shaped charge liners and jets, flat plate shots, imploding systems, and HEAF powder gun impact tests. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Provide physically-based continuum code description that quantitatively describes behavior of explosives in abnormal environments. -Combine infrared measurements with high resolution image converter camera to study spall and phase changes in shocked metal systems. - Complete hard-target penetrator testing in limestone and develop and implement material models into computational tools. Initiate oblique penetration testing into rock and testing on weathered rock.
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FUNDING LEVELS:

\$34,585	\$21,446	\$18,096
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Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP** - *Programs & Initiatives*
SPECIAL PROJECTS

WEAPONS TRANSPORTATION SAFEGUARDS SYSTEMS developed and produced a prototype of the SafeGuards Transporter to replace the 20 year old Safe Secure Transport for ground transportation of weapons and special nuclear materials. This effort transitioned to a production effort funded within Weapons Stockpile Management in FY 1997.

MEASURABLE PERFORMANCE ACTIVITIES (Special Projects/Weapons Transportation Safeguards Systems Detail):

<p><u>FY 1996</u></p> <ul style="list-style-type: none"> - Completed SafeGuards Transporter (SGT) prototype in December 1995 establishing preliminary production capabilities at Allied Signal/FM&T and providing the initial vehicle to be used for system validation. - Completed a Nuclear Explosive Safety Study for the SGT and subsequent Final Design Review allowing the commencement of production activities. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - No research and development activities continue in this category. - Support transition to production effort, including release of production drawing definition, completion of software development and independent vulnerability assessment, complete prototype testing and analysis, and complete final development report and release test equipment specifications. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - No research and development activities continue in this category.
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FUNDING LEVELS:

\$3,000	\$0	\$0
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Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP - Programs & Initiatives**
SPECIAL PROJECTS

EXTRAORDINARY ES&H SITE REMEDIATION focuses on completing significant one-time prioritized corrective actions that do not meet the funding criteria of Environmental Restoration and Waste Management. These actions are the principal responsibility of Defense Programs, the landlord at the three weapons laboratories and the Nevada Test Site. Previous projects have included the Propellants, Explosives, and Pyrotechnics Evaluation and Reapplications project which disposed of several hundred excess rocket motors stored at Sandia Technical Area 3 and the cleanup of the Tritium Research Laboratory (TRL) at SNL. Remediation of the TRL involved the removal of potentially contaminated equipment, decontamination and the performance of radiological surveys. Ongoing activities include the initiative to partially fund the effort at Sandia National Laboratories for decontamination, decommission, and demolition of surplus facilities. This program is intended to meet Defense Programs landlord responsibilities for management of surplus legacy facilities, thereby reducing operating costs and infrastructure needs. Stored plutonium at Lawrence Livermore National Laboratory will be "recanned" in modern canisters under the approved implementation plan to Defense Nuclear Facilities Safety Board Recommendation 94-1. The corresponding DP effort at Los Alamos National Laboratory is being funded in the weapons Stockpile Management account.

MEASURABLE PERFORMANCE ACTIVITIES (Special Projects/Extraordinary ES&H Site Remediation Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Reclassified the Tritium Research Laboratory to a radiological facility after a complete verification and radiological characterization. Initiated final stack monitoring at with the expectation that stack monitoring will be completed in early FY 1997 after fulfilling requirements of agreement among SNL, Environmental Protection Agency, and DOE. - Continued decontamination and verification at SNL, including activities within buildings 805, 869, and 845. Completed demolition of the following SNL buildings: 846, 844, 829, 834, 838, and 839. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Complete TRL stack monitoring. - Continue Defense Programs Landlord Decontamination and Demolition Program at SNL. - Begin the Lawrence Livermore effort to "re-can" stored plutonium to modern canisters per Defense Nuclear Facilities Safety Board recommendation 94-1. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Continue Defense Programs Landlord Decontamination and Demolition Program at SNL. - Continue the LLNL effort to "re-can" stored plutonium to modern canisters per DNFSB recommendation 94-1.
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FUNDING LEVELS:

\$2,900	\$3,254	\$663
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JOINT DOD/DOE MUNITIONS TECHNOLOGY DEVELOPMENT PROGRAM: This program, operating under the auspices of the Non-Nuclear Munitions Technology Memorandum of Understanding (MOU) between the Department of Defense (DoD) and the DOE, represents a leveraging of funds and resources to improve the capabilities of nonnuclear munitions. Matching funds from the two departments support a cooperative program of research and development in areas of mutual interest between the DoD and DOE including energetic materials, electronics, warhead technology, and a variety of supporting technologies. Activities in this category are coordinated through a five year plan that is updated and approved annually by both agencies.

MEASURABLE PERFORMANCE ACTIVITIES (Special Projects/Joint DOD/DOE Munitions Technology Development Program Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Continued to provide improved TNAZ explosive production plant technologies for significantly reduced environmental burden. - In joint field testing with the Navy, demonstrated the capability of the ion mobility spectrometer to detect TNT and RDX explosives at trace levels. - Provided first successful measurement of shocked metal surface temperature using infrared detector array and optics system. - Demonstrated significant change in the size of the time step for a calculation of a small-scale cookoff test, and improved the numerical solvers in ALE3D making the code more accurate and robust. - Operated molten salt destruction pilot plant and demonstrated that production-like capability is ready for transitioning. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Infrared detector array to be employed for temperature measurement on a variety of shocked metal surfaces, including shaped charge liners and jets, flat plate shots, imploding systems, and HEAF powder gun impact tests. - Continue development of ALE3D, transitioning to parallel ALEC, including a generalized equation of state for a variety of materials and states, incorporation of a burn model that may range from a simple laminar burn to a more complex approach such as flame sheet, generalize reactive flow incorporating actual physical parameters, statistical ignition and propagation model, and inclusion of new material models as they are developed. - Continue to extend and develop a new class of compression moldable materials with additional energetic thermoplastic elastomeric binders and processes to manufacture these composite explosives. - Implement burn dynamics model into computational tools for improved early phase violence of reaction response in cookoff accident analysis. - Provide new explosives formulations as options for improved replacements for main charge materials. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Provide physically-based continuum code description that quantitatively describes behavior of explosives in abnormal environments. - Reduce semiconductor bridge slapper detonator energy significantly. - Infrared measurements to be combined with high resolution image converter camera to study spall and phase changes in shocked metal systems. - Apply ALE3D to a wider range of real-world problems to identify areas of strength and weakness in ALE3D as well as to help understand underlying phenomena to aid in improving predictive capability. - Validate material constitutive models through prediction of temperature of shocked metals and comparison with experiments. - Complete hard-target penetrator testing in limestone and develop and implement material models into computational tools. Initiate oblique penetration testing into rock and testing on weathered rock.
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FUNDING LEVELS:

\$16,496	\$14,153	\$14,033
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Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP - Programs & Initiatives**
SPECIAL PROJECTS

OTHER ACTIVITIES provides for miscellaneous activities required to support the ongoing Stockpile Stewardship program. This includes ongoing research and development support activities with other federal agencies, such as the National Institute of Science and Technology. Activities also include small one-time efforts that do not fit easily into other budget categories and for which special visibility is required, such as the environmental impact statement for the Dual-Axis Radiographic Hydrodynamic Test (DARHT) Facility at Los Alamos National Laboratory.

MEASURABLE PERFORMANCE ACTIVITIES (Special Projects/Other Activities Detail):

<u>FY 1996</u> - Supported legal activities associated with the injunction against proceeding with construction of DARHT.	<u>FY 1997</u> - Continue miscellaneous support as required to maintain the flexibility of the Stockpile Stewardship program.	<u>FY 1998</u> - Continue miscellaneous support as required to maintain the flexibility of the Stockpile Stewardship program.
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FUNDING LEVELS:

\$12,189	\$4,039	\$3,400
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THREAT ASSESSMENT AND TREATY IMPLEMENTATION: These activities focus on forging a link between other national security programs and the core nuclear weapon stewardship programs. They provide Defense Programs with an assessment of the future threat environment (technical, political, arms control, etc.) in which its nuclear weapon stewardship mission will be carried out. They also include technology research on surprise proliferation response technologies.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Synergistically link the capabilities of the weapons program to the needs of the national security community.
- Increase knowledge in major program elements including systems studies, intelligence-related systems research, proliferation-related information management, knowledge preservation, and proliferation training to allow treaty implementation with full knowledge of potential implications.

CHANGE FROM FY 1997: Beginning in FY 1998, these activities have been re-integrated into other budget categories.

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Field tested the Mobile Gas Laboratory on the KUCHEN experiment. This laboratory can be used for the yield measurement of hydronuclear tests, prompt and post-shot gas sample collections as well as treaty verification experiments. - Completed a proof-of-principle experiment that the response of conventional HPGe detectors can be enhanced by digital signal processing methods. - US/Russians technical working group on warhead safety and security met for technical exchange under the Agreement on Warhead Safety and Security Information Exchange. - Provided technical support for the Scientific and Technical Cooperation Program to help U.S. and Russia maintain the safety and security of nuclear stockpiles under a Comprehensive Test Ban. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Work to establish the enhanced response of HPGe detectors using digital signal processing. - Support interdiction analysis by systematically modeling the various production processes involved in manufacturing nuclear, chemical, and biological agents. - The Warhead Safety and Security Information Exchange (WSSX) will move from organizing and planning to technical collaboration. - Continue to enhance and preserve the hardware and software skills needed to identify vulnerabilities in high consequence systems, especially vulnerabilities associated with using COTS components, specific materials, software, complex integrated circuits, and managing data. 	<p><u>FY 1998:</u></p> <p>These activities have been transferred to other budget categories within Stockpile Stewardship.</p>
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FUNDING LEVELS:

\$18,355	\$16,965	\$0
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CORE RESEARCH AND ADVANCED TECHNOLOGY provides the science and technology infrastructure, including technical expertise and facilities, needed to support Department of Energy (DOE) defense missions, programs, and initiatives. Emphasis is placed on those research and technology development activities necessary (a) to maintain and improve the understanding of the underpinning science of complex nuclear weapons systems and subsystems and (b) to advance the enabling technologies used in their design, assessment, engineering, production, certification, surveillance, dismantlement, and disposal. It sustains the DOE defense core competencies and core technologies which provide the principal opportunities for assistance to the private sector both in technology and product development and in advanced manufacturing capabilities and other Federal research, both within DOE and other agencies. The draft "Weapons Core Research Program Plan" provides the planning basis for this activity by establishing explicit goals and research priorities. Programmatic Categories include: **Performance Assessment Science & Technology, Systems and Components Science & Technology, Chemistry and Materials Science & Technology, and Computations and Modeling.**

PROGRAM GOALS/ONGOING ACTIVITIES:

- Explore concepts, facilities, and technologies that offer options for meeting all future requirements of the enduring stockpile,
- Demonstrate and incorporate new technologies and materials that insure the long-term health, safety and reliability of the stockpile,
- Accelerate the technological growth curve and take advantage of advances to achieve environmental, safety, health and financial savings throughout the life cycle of all stockpile weapons.

CHANGE FROM FY 1997: Reduced funding to accommodate funding increases for the DARHT facility.

FUNDING LEVELS:

\$482,652	\$549,899	\$526,147
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PERFORMANCE ASSESSMENT SCIENCE & TECHNOLOGY: These elements, commonly dealing with theoretical research, a heavy physics orientation and a computationally intense activity, emphasize anticipated future national security missions and requirements.

Programmatic Subcategories include **Performance Assessment, Physics, Los Alamos Neutron Science Center, and Advanced Hydrodynamic Radiography.**

PROGRAM GOALS/ONGOING ACTIVITIES:

- Explore concepts and technologies that offer options for meeting future national security requirements and missions,
- Support basic weapons physics research for components, radiation source development, improved diagnostics and facilities,
- Take advantage of LANSCE's ability to provide critical data in the detection of small-scale material defects, and
- Address the need for an advanced hydrodynamic radiography capability to provide information about weapon implosions.

CHANGE FROM FY 1997: Decrease reflects reallocation of funding for subcritical experiments.

MEASURABLE PERFORMANCE ACTIVITIES (Summary of Performance Assessment Science & Technology Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Obtained the first measurements of soot volume fraction and soot temperature in a field-scale fire, necessary to move toward predictive fire simulation for weapon safety. - Center for Advanced Fluid Dynamics Applications collaborated in projects with NCAR, Princeton University, UC-Davis, Caltech, and Univ. of Arizona. - Achieved a world record x-ray power of 85 terawatts within a total x-ray energy in excess of 400 kJ on Saturn (SNL) with a tungsten wire array z-pinch load. - Demonstrated advanced radiography technology at LANSCE at 200-MeV and at higher energies at Brookhaven National Laboratory (BNL). Magnetic Lensing technology also demonstrated at BNL. - Developed a Tri-Laboratory Advanced Hydrodynamic Radiography Technology Development Plan. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Develop a new capability in Low Energy Electron Microscopy for real-time investigations of surface processes related to materials aging and stability. The process will be used to validate and refine predictive models of aging phenomena based on existing atomic-scale probes and high-performance calculations. - Demonstrate the scaling of vacuum hohlraum temperatures from Saturn to PBFA-Z current levels, and apply to proof-of-principle weapon physics experiments. - <u>Advanced Radiography Technology:</u> Develop proton radiography detector technology at LANSCE. Work toward implosion imaging experiment at high energy. - Continue support of the Dual-Axis Radiographic Hydrodynamic Test Facility construction effort. Continue development of phased explosion containment technologies. Examine potential technologies for the second accelerator arm of the facility. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Apply weapon security risk assessment methodology to study DoD and DOE storage sites. Previous DOE exercises will be used to validate conflict simulation tools. Carry out cost/benefit analysis on risk reduction measures. - Demonstrate simulation of fire in combustible enclosures for weapon threat assessments and facility protection. - Support initiation of physical construction of the Contained Firing Facility addition to the Flash X-Ray Facility at LLNL's Site 300.
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FUNDING LEVELS:

\$196,357	\$209,960	\$196,300
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Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP - Core Research & Advanced Technology**
 PERFORMANCE ASSESSMENT SCIENCE & TECHNOLOGY

PERFORMANCE ASSESSMENT: Explore concepts and technologies that offer potential options for meeting future national security requirements and missions. Although these activities do not involve formal hardware development, they may include a limited amount of prototyping or experimentation to assess or demonstrate conceptual feasibility. They often require intensive computational analysis. Current areas of interest include, but are not limited to, advanced electromagnetic radiation, stealth, and enhanced safety features such as fire resistant pits (FRP), insensitive high explosives (IHE), insertable nuclear components, paste explosives, and advanced containment.

MEASURABLE PERFORMANCE ACTIVITIES (*Performance Assessment Science & Technology/Performance Assessment Detail*):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Implemented improvements in PRONTO3D allowing more efficient three-dimensional modeling of complex structures. - Began the B61-11 assessment and the W76 dual revalidation physics assessment. - Extended surface CHEMKIN to address solid-state chemical issues for long-term stockpile health such as corrosion. - Developed requirements for physical database improvements in the areas of opacity, equation of state, and other material properties. - Obtained the first measurements of soot volume fraction and soot temperature in a field-scale fire, necessary to move toward predictive fire simulation for weapon safety. - Developed 2D Element Free Galerkin techniques to analyze fracture propagation in solids. - Center for Advanced Fluid Dynamics Applications collaborated in projects with NCAR, Princeton University, University of California-Davis, Caltech, and University of Arizona. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Construct a calculational model for the B61 mods. The new model will take advantage of developing capabilities to evaluate the details of the stockpile design. In addition, the calculational fidelity of the new numerical machinery will be evaluated by comparing the model results with old data from underground nuclear tests. - Develop a detailed 2D model of the W76 tactical configuration in support of the W76 dual revalidation program. - Begin W88 pit rebuild physics assessment in FY 1997, engineering assessment scheduled for FY 1998. - Develop phenomenological bases for fire propagation. - Develop phenomenological modules for physical and chemical aging of energetic materials. - Develop a new capability in Low Energy Electron Microscopy for real-time investigations of surface processes related to materials aging and stability. The process will be used to validate and refine predictive models of aging phenomena based on existing atomic-scale probes and high-performance calculations. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Apply weapon security risk assessment methodology to study DoD and DOE storage sites. Previous DOE exercises will be used to validate conflict simulation tools. Carry out cost/benefit analysis on risk reduction measures. - Begin W88 pit rebuild physics engineering assessment. - Based on mid-wave infrared source technology and high explosive degradation gas sensors developed in previous years, integrate a source-detector system into a prototype HE component containing an on-board HE degradation sensor. - Demonstrate simulation of fire in combustible enclosures for weapon threat assessments and facility protection. - Complete DOE/DSWA B-52 Weapon System Safety Assessment, which is assessing the risk of SNM dispersal and inadvertent nuclear detonation for the weapons carried on the B-52H, including the B83. - Develop a theory of the structure and dynamics of filled encapsulates and compute the stress field within the encapsulant after an arbitrary strain history. Incorporate the theory into component design codes.
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FUNDING LEVELS:

\$29,065	\$42,795	\$32,795
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PHYSICS: Supports basic weapons physics research for both nuclear and nonnuclear components, radiation source development, development of improved diagnostics for use in aboveground experimental facilities, and upgrades to those facilities. Physics issues involving hydrodynamics, radiation physics, plasma physics, nuclear physics, solid state physics, optical physics, and chemical physics are being addressed to provide important physics understanding, code validation, and to sustain the skills of theoretical and experimental scientists. Modeling studies complement the physics effort by using important inertial fusion facilities to conduct weapons-related physics experiments.

MEASURABLE PERFORMANCE ACTIVITIES (Performance Assessment Science & Technology/Physics Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Achieved a world record x-ray power of 85 terawatts within a total x-ray energy in excess of 400 kJ on Saturn (SNL) with a tungsten wire array z-pinch load. - Achieved a record electrical current level in a joint high-explosive pulsed power experiment executed with the Russians at VNIIEF. - Discovered metallic hydrogen fluid at 1.4 Mbar in quasi-isentropic shock compression experiments. - Obtained high resolution, 2D electron density measurements of large-scale-length plasmas to study the dynamic evolution of counter-streaming colliding plasmas using a soft x-ray interferometry technique. - Developed and improved weapon modeling techniques that maintain and improve capabilities essential to science-based Stockpile Stewardship. - Discovered microjets in first-shock interface experiments at the Pegasus facility and benchmarked them against hydro simulations. - Performed experiments to correlate aboveground experiments with underground test results. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Demonstrate the predicted scaling, based on models of z-pinch implosions on Saturn, of x-ray output energy (to >1.5 megajoules) and power (to >150 terawatts) on PBFA-Z for 16 megaamps delivered to a wire-array load. - Demonstrate the predicted scaling of vacuum hohlraum temperatures from Saturn to PBFA-Z current levels, and apply to proof-of-principle weapon physics experiments in the areas of radiation flow, equation of state, and capsule implosions in centimeter-scale hohlraums. - Perform hydrodynamic tests of a mock reassembly of the W76. - Conduct weapon physics experiments in high-energy-density environments. - Develop and improve nuclear and atomic data and the ability to use them to meet future design needs. - Continue support of the Atlas facility construction effort. - Perform actinide equation-of-state calculation and experiments. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Demonstrate a well characterized, reproducible, flexible pulsed-power-driven radiation environment for weapon physics and ICF experiments, e.g., pulse shape and length, spatial uniformity, and spectral selectivity. - Obtain basic equation of state data on plutonium and continue measurements on basic properties of tantalum, uranium, and beryllium. - Evaluate properties of surrogate material at high strain rate using Pegasus or Procyon. - Continue to conduct experiments at the Nevada Test Site. - Perform radiation flow experiments at PBFA-Z. - Perform pulsed-power-driven experiment using plutonium at the Lyner complex at the Nevada Test Site. - Support installation of major systems into the Atlas facility.
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FUNDING LEVELS:

\$130,998	\$118,295	\$116,105
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LOS ALAMOS NEUTRON SCIENCE CENTER (LANSCE): The LANSCE facility provides a new source of critical data in the detection of small-scale material defects which might serve as indicators of weapon component aging (deterioration/damage) and in the prediction of material performance. This capability will be important in supporting the enduring stockpile and in anticipating future problems, rather than reacting to them. Activities include testing the concept of fast neutron radiography of weapon system major components, temperature measurement in shock-insulted explosives using a unique probe based on neutron resonance absorption, spatially-resolved measurements of strain in materials of importance in weapons manufacture, and determination of bulk texture of materials.

MEASURABLE PERFORMANCE ACTIVITIES (Performance Assessment Science & Technology/Los Alamos Neutron Science Center Detail):

<p><u>FY 1996:</u> In FY 1996 Defense Programs assumed management responsibility for the LANSCE facility from ER.</p> <ul style="list-style-type: none"> - <u>Advanced Radiography Technology:</u> Demonstrated at 200-MeV at LANSCE and at higher energies at Brookhaven National Laboratory. Magnetic Lensing technology also demonstrated at BNL. - Improved resolution for neutron radiography to 1mm level and developed detectors of intrinsically higher resolution capability. Employed tomographic image reconstruction methods. - <u>Weapons Materials Science:</u> Provided crystallographic texture characterizations on uranium samples. Carried out internal strain measurements of samples. Conducted polymer adhesion studies. Developed apparatus for phonon spectroscopy on plutonium. - <u>Weapons Design Physics:</u> Conducted Debye-Waller factor measurements. Developed high-pressure diffractometry capability. Planned dynamic spectroscopy experiments to examine frictional heating processes. - <u>Weapons Nuclear Data:</u> Installed 21-element gamma ray detector array obtained from Lawrence Berkeley National Laboratory. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - <u>Advanced Radiography Technology:</u> Develop proton radiography detector technology at LANSCE. Work toward implosion imaging experiment at high energy. - Continue conceptual development and experimental tests for a single-axis, 800 MeV dynamic radiography testbed facility. - Conduct neutron radiography experiments intended to discover and characterize defects of unknown character. - <u>Weapons Materials Science:</u> Begin obtaining phonon measurements on materials other than plutonium. Measure textures in remanufactured pit components and compare with measurement on components taken from the stockpile. - <u>Weapons Design Physics:</u> Measure high-pressure Debye-Waller factors for Pu alloys by neutron diffraction techniques. Perform dynamic experiments using resonance neutron radiography to explore shock-wave physics. - <u>Weapons Nuclear Data:</u> Complete ²³⁹Pu-target measurements. Conduct measurements on other elements used as radiochemical detectors (e.g., thulium and lutetium). 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - <u>Advanced Radiography Technology:</u> Continue neutron radiography experiments intended to discover and characterize defects of unknown character. - Continue conceptual development and experimental tests for a single axis, 800 MeV dynamic radiography test bed facility. - <u>Weapons Material Science:</u> Upgrade instrument for phonon measurements and undertake the first phonon spectrum measurements on plutonium. - <u>Weapons Design Physics:</u> Continue measurement of Debye-Waller factors for plutonium alloys by neutron diffraction techniques. - Continue performing dynamic experiments to explore shock-wave physics. - <u>Weapons Nuclear Data:</u> Continue conducting measurements on elements used as radiochemical detectors. - Continue high precision cross-section measurements to exploit full potential of NTS diagnostic archives.
<i>FUNDING LEVELS:</i>		
\$34,294	\$37,160	\$40,916

PERFORMANCE ASSESSMENT SCIENCE & TECHNOLOGY

ADVANCED HYDRODYNAMIC RADIOGRAPHY: Supports research to address the need for an advanced hydrodynamic radiography capability to provide information about weapon implosions. This capability must satisfy three key requirements: 1) accurate density profile measurements of the interior of a thick object, 2) multiple views of that object, and 3) multiple time exposures along some views. Several candidate technologies are being explored, and results will be used to design future radiographic facilities.

MEASURABLE PERFORMANCE ACTIVITIES (Performance Assessment Science & Technology/Advanced Hydrodynamic Radiography Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Developed a Tri-Laboratory Advanced Hydrodynamic Radiography Technology Development Plan to guide and coordinate the DOE advanced hydro test capabilities. - Demonstrated the Inductive Voltage Adder technology for producing very bright compact x-ray sources for Advanced Hydrodynamic Radiography. - Supported the resumption of construction activities for the Dual-Axis Radiographic Hydrodynamic Test Facility, LANL. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Continue support of the Dual-Axis Radiographic Hydrodynamic Test Facility construction effort. Continue development of phased explosion containment technologies. Examine potential technologies for the second accelerator arm of the facility. - Scale IVA technology to single-shot Advanced Hydrodynamic Radiography parameters on HERMES-III (SNL) and demonstrate utility by radiographing the "French Test Object." - Model beam-target interaction for high-dose, multipulse radiography with PIC, Monte Carlo, and MHD codes in support of AHR technology. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Support initiation of physical construction of the Contained Firing Facility addition to the Flash X-Ray Facility at LLNL's Site 300. - Continue support of the Dual Axis Radiographic Hydrodynamic Test Facility construction. - Develop imaging to measure pit ejecta, and measure surfaces of shocked materials. - Model beam-target interaction for high-dose, multipulse radiography with PIC, Monte Carlo, and MHD codes in support of AHR technology.
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FUNDING LEVELS:

\$2,000	\$11,710	\$6,484
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SYSTEMS COMPONENTS SCIENCE & TECHNOLOGY: Supports research program elements which emphasize the integration of warhead systems with delivery systems, and advancement of subsystem enabling technologies. Research includes component modularity, standardization, and reuse; utilization of microelectronic systems to improve safety, security and reliability; and development of the tools, methods, and processes needed to support future design and manufacturing requirements.

Programmatic Subcategories include: **Systems Engineering, Electronics, Photonics, Sensors & Mechanical Components, and Advanced Manufacturing.**

PROGRAM GOALS/ONGOING ACTIVITIES:

- Incorporate new technologies into weapon systems and stockpile support operations,
- Support improved command and control, performance instrumentation, safing, arming, fusing and firing,
- Provide intelligent systems that diagnose the condition of weapons with regard to aging, functional status, intrusion/tamper detection, and anticipated performance.
- Develop and qualify advanced processes for materials and components.

CHANGE FROM FY 1997: Advanced manufacturing activities are supported at a reduced level of effort.

MEASURABLE PERFORMANCE ACTIVITIES (Summary of Systems Components Science & Technology Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Modified a commercial 0.5 micron CMOS digital circuit technology for protection against single-event upset from ionizing radiation and have produced a prototype circuit immune to single-event effects at better than 0.6 micron to enable a high-performance digital, radiation-hard application-specific integrated circuit capability. - Developed polysilicon, surface-micromachined micro-electro-mechanical systems technology that realized proof-of-concept components that performed weapon strong link functions of discrimination and energy re-direction. Technology was recognized by <i>Industry Week</i> as one of the top five technological breakthroughs of the year. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Provide tools, methods, and standards as vehicles for models-based engineering applications, particularly for infusion to the Warhead Protection project, the pit manufacturing project, the W76 Dual Revalidation , and advanced manufacturing. - Develop a packaging test chip to allow in-situ reporting on the health of the weapon packaging in electronic subassemblies. - Develop ferroelectric, encapsulant foam replacement materials. Attention will be focused on development and characterization of processes to product PZT ferroelectric materials used in neutron generators. Three different replacement processes will be evaluated initially to understand the potential of each. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Apply advanced nondestructive evaluation techniques to weapon component examinations, including artifact reduction codes, non-contact thermal measurements, and inverse techniques to image complex multidimensional data. - Migrate radiation-hard 2-micron CMOS technology to a radiation-hard analog 1-micron CMOS technology within the SNL Microelectronics Development Laboratory. - Develop rapid prototyping on non-metals using laser-enhanced, near-net shape approaches and rapid prototyping of gauges and fixtures.
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FUNDING LEVELS:

\$108,444	\$118,925	\$116,517
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SYSTEMS ENGINEERING: Facilitates the incorporation of new technologies into weapon systems and stockpile support operations and demonstration of emerging technologies; and supports improved command and control, performance instrumentation, safing, arming, fusing and firing. These activities sustain capabilities required for the monitoring and assessment of new technologies, command structures, new stockpile configurations, and external threats. Major program focus is on interfacing with a mix of commercial vendor design, analysis, and manufacturing systems to explore component standardization, modularity, and reuse for the manufacture of small-lot, ultra-high reliability components and subsystems, reducing both costs and waste generation.

MEASURABLE PERFORMANCE ACTIVITIES (Systems and Components Science & Technology/System Engineering Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Fabricated a war reserve-like component that emulated critical weapons geometry and was concurrently engineered and produced first at LANL and then at Y-12 using models-based engineering principles, as part of the As-built engineering project. - Supported Device Assembly Facility (NTS) startup operations with the preparation of the Single Integrated Input Document (SIID) for the nuclear explosives safety master study. The management review of the SIID was completed in July 1996. The master study is scheduled for first quarter FY 1997. - Developed and coordinated a GPS Block IIR Integration Plan with Space and Missile Systems Center. This plan allows the integration of the NDS Augmentation Payload with the GPS Block Satellites 13-21, with options for Satellites 9-12. - Developed new failure analysis techniques that improve our ability to nondestructively examine weapon electronic components for defects. Scanning fluorescent microthermal imaging uses a scanning laser microscope and a temperature dependent fluoressor to provide improved temperature and spatial resolution. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Provide tools, methods, and standards as vehicles for models-based engineering applications, particularly for infusion to the Warhead Protection project, the pit manufacturing project, the W76 Dual Revalidation , and advanced manufacturing. - Develop system level design tools to evaluate functional tradeoffs at the weapon system level. Develop assembly tools for assessing mechanical layout options. These key tools will be used in the Warhead Protection Program conceptual design optimization activities. - Demonstrate integrated micro-electromechanical systems for use control and safety in an optical firing system. - The first NDS Augmentation Payload will undergo integration and testing for delivery in July 1997 to the GPS spacecraft contractor for GPS Satellite 13, with subsequent units for GPS Satellites 14-21. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Apply advanced nondestructive evaluation techniques to weapon component examinations, including artifact reduction codes, non-contact thermal measurements, and inverse techniques to image complex multidimensional data. - Develop reliability assessment tools. Develop explicit links to subsystem and component design evaluation tools. Deploy requirements tracking tools throughout the weapon engineering community. - Establish a methodology for developing, analyzing and validating high-integrity solid-architecture, ultra-reliability designs, and the interrelationship of hardware and software. - Demonstrate a fully integrated micro-electromechanical systems-based optical arming, fuzing and firing system. - Further integrate nuclear explosive safety management into NTS operations. Bring the Device Assembly Facility on line, in support of subcritical experiments, implementing the integrated management/safety programs that been developed in the last two years.
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FUNDING LEVELS:

\$65,880	\$64,530	\$66,756
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ELECTRONICS, PHOTONICS, SENSORS & MECHANICAL COMPONENTS: Research in the enabling technologies for components and subsystems which control and operate nuclear weapons, and in intelligent systems that monitor and diagnose the condition of weapons with regard to aging, functional status, intrusion/tamper detection, and anticipated performance. Emphasis is on devices used in conjunction with microelectronic systems offering improved safety, security, reliability, and information processing; improved safety in abnormal environments; enhanced command and control; automated monitoring and inventory control; command disablement; and intelligent manufacturing based on the use of robotics.

MEASURABLE PERFORMANCE ACTIVITIES (Systems and Components Science & Technology/Electronics, Photonics, Sensors & Mechanical Components Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Modified a commercial 0.5 micron CMOS digital circuit technology for protection against single-event upset from ionizing radiation and produced a prototype circuit immune to single-event effects at better than 0.6 micron to enable a high-performance digital, radiation-hard application-specific integrated circuit capability. - Combined vertical-cavity, surface-emitting semiconductor laser technology with diffractive optical elements to establish a baseline, proof-of-concept design for monitors that provide feedback, control, and arm-safe information in detonator surety devices. - Developed optical wavelength filter prototypes to be used in Rainbow Xpress. - Completed demonstration of patented transverse lasing optical amplifiers for crosstalk suppression. - Developed polysilicon, surface-micromachined micro-electro-mechanical systems technology that realized proof-of-concept components that performed weapon strong link functions of discrimination and energy re-direction. Technology was recognized by <i>Industry Week</i> as one of the top five technological breakthroughs of the year. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Test the coarse-resolution radiation spectrometer using arrays of RadFETs with various nuclear materials to determine if the device can detect radiation sources . A low-power miniaturized version of the sensor will be installed inside a container to monitor chemical concentrations as part of the INuMM program. - Implement advanced process control with real-time feedback from in-situ process sensors on the MOCVD and MBD growth platforms to achieve high-reliabilities, reportable growth of advanced VCSEL structures for electro-static immune, optical interconnects for weapons applications. - Develop a packaging test chip to allow in-situ reporting on the health of the weapon packaging in electronic subassemblies. - Continue development of photonic technology for computer interconnects. This technology will be deployed in a multiprocessor interconnect demonstrator. These optoelectronic technologies include compound semiconductor transmitters with associated drive electronics, optical wavelength filter assemblies, and low-cost packaging and assembly techniques. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Migrate radiation-hard 2-micron CMOS technology to a radiation-hard analog 1-micron CMOS technology within the SNL Microelectronics Development Laboratory. - Develop a first-principles model of total-dose radiation effects that relate circuit manufacturing process steps to ultimate radiation hardness by predicting the hardness of radiation-tolerant and radiation-hardened technologies for varying process conditions. - Construct an array of new magnetically-excited flexural plate wave sensor devices with chemically-sensitive films and pattern recognition to discriminate chemical species. - Study aging of known flaws in packages currently in the stockpile to predict risk of bond pad mechanical damage (cratering), marginal hermeticity on the small 40-pin package, and corrosion on the castellation of the ceramic package. - Develop blue emitters based on GaN quantum nanocrystals.
<p>FUNDING LEVELS:</p>		
<p>\$34,100</p>	<p>\$31,605</p>	<p>\$34,795</p>

ADVANCED MANUFACTURING: Develops the tools, methods, and processes needed to support future design and manufacturing requirements. This activity comprises core activities in manufacturing, materials, intelligent systems and machines, and components research, and contributes the science base to enable the development and deployment of cost effective, environmentally acceptable product realization technologies, processes, and methods in direct support of the nuclear weapons stockpile. The DP overall goal is to provide alternatives to using large facilities and replace them with modern infrastructure, using modern information technology and model-based design and development technologies.

MEASURABLE PERFORMANCE ACTIVITIES (Systems and Components Science & Technology/Advanced Manufacturing Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Developed key product and process models, including a coupled thermomechanical model of processes occurring during the cure of polymeric encapsulation. Deployed models for gas-tungsten-arc welding process analysis. - Demonstrated FASTCAST by producing hardware for test in the B61-11 project from CAD files in 19 working days. - Demonstrated the utility of intelligent manufacturing with a product change-over time of 10 minutes for an automatic cleaning cell. The cell was designed to use printed wiring board ProE layout files as input and to automatically plan the spray head path and dwell times. - Developed a standard (CORBA-compliant) Product Realization Environment. Established AS/FM&T and other key suppliers with special attention to control of information in need -to-know environment. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Develop ferroelectric, encapsulant foam replacement materials. Attention will be focused on development and characterization of processes to product PZT ferroelectric materials used in neutron generators. Three different replacement processes will be evaluated initially to understand the potential of each. - Develop soldering process models to optimize electronics product for manufacture. - Develop rapid fabrication of metal and nonmetal prototypes using laser-enhanced, near-net-shape technology. - Develop network links to key commercial suppliers by evaluating firewalls. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Develop supplier independent strategies to provide radiation-hard devices. - Develop performance and process models for electronics packaging. - Develop models of test processes and design-for-test methods. - Develop rapid prototyping on nonmetals using laser-enhanced, near-net shape approaches and rapid prototyping of gauges and fixtures.
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FUNDING LEVELS:

\$8,464	\$22,790	\$14,966
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CORE STOCKPILE STEWARDSHIP-CORE RESEARCH & ADVANCED TECHNOLOGY-Systems Components Science & Technology Detail (3 of 3)

CHEMISTRY AND MATERIALS SCIENCE & TECHNOLOGY: The specialized materials developed and used in nuclear weapons and their reliability requirements have

created a unique set of materials science challenges. These activities are required to address the resolution of aging and reliability issues of weapons; and support remanufacture of components in a timely, cost effective, and environmentally benign way. Programmatic Subcategories include: **Chemistry and Materials, High Explosives, Special Nuclear Materials, and Tritium.**

PROGRAM GOALS/ONGOING ACTIVITIES:

- Maintenance of engineering competence in materials science,
- Development of models to study aging phenomena, and
- Development of alternative materials to reduce environmental, safety and health concerns.

CHANGE FROM FY 1997: Supports reduced level of effort for tritium activities.

MEASURABLE PERFORMANCE ACTIVITIES (Summary of Chemistry and Materials Science & Technology Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Collected and analyzed soil and gas samples in the NTS U1a complex to investigate gas permeability surrounding subcritical experiments. - Established that thin tantalum nitride films on sapphire substrates used for weapon microelectronics are very susceptible to fracture along the film-substrate interfaces. - Progressed predictive capability for HE initiation under slow heat or impact conditions. - Developed experimental techniques to determine the amount of helium ingrowth during the aging of plutonium. - Provided significant support for pre-D&D tritium removal activities at EG&G Mound, receiving first R&D storage vessels for recovery and disposition. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Evaluate new salt fabrication technology for Y-12 plant. - Analyze crack growth, fracture processes and mechanisms controlling hydrogen-induced failure to help determine the time-dependent safety margins for gas transfer components. - Develop and complete models of HE microstructure stability and catalogue that stability as a function of aging in stockpile models that relate age-induced changes in high explosive structure and performance. - Expand uranium characterization studies to evaluate the increased carbon concentrations within production materials and the further increases induced by anticipated production application of material recycle. - Begin to remove the tritiated salts line in preparation for closing down the Tritium Salt Fabrication Facility. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Develop a microstructural model of long-term crack propagation in ceramics. - Develop materials and fabrication techniques for drastically reduced volume thermal batteries. - Complete installation of a 5 Beam Fabry Perot Laser System in the 10Kg firing area of LLNL's Site 300. - Begin to assess the feasibility of using the SMPE "dip stick" technique for real-time measurement of organic decomposition in weapons and begin to instrument a weapon "test bed." - Continue plutonium immobilization and disposition program activities.
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FUNDING LEVELS:

\$65,204	\$65,869	\$61,830
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CORE STOCKPILE STEWARDSHIP-CORE RESEARCH & ADVANCED TECHNOLOGY-Chemistry and Materials Science & Technology Summary

CHEMISTRY AND MATERIALS: Research in materials synthesis and processing, determination of materials structure and composition, and development of functional properties in polymers, metals, ceramics, inorganic and organic materials, and composites. The specialized materials developed and used in nuclear weapons and their reliability requirements have created a unique set of materials science challenges. These activities are required to address the resolution of weapons aging and reliability issues; to support the remanufacture of stockpile components in a timely, cost effective, and environmentally benign way; and to enhance the reliability and surety of remanufactured components. Pertinent objectives include maintenance of engineering competence in this unique set of materials science, development of models to study aging phenomena, and development of low toxicity alternative materials to reduce environmental, safety and health concerns associated with weapons production, maintenance, and dismantlement.

MEASURABLE PERFORMANCE ACTIVITIES (Chemistry and Materials Science & Technology/Chemistry and Materials Details):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Demonstrated that detonation front curvature is a good calibrator of reaction rates in time-dependent detonations. - Characterized the uranium-6 wt% niobium radiation case alloy to define the acceptable ranges for alloy homogeneity, microstructure, and mechanical properties for component requalification and reuse. - Used SRXRD to measure allotropic phase transformation during welding of commercially pure titanium. - Investigated effect of grain boundary character distribution on the performance of shaped-charge jets of Cu. - Collected and analyzed soil and gas samples in the NTS UNA complex to investigate gas permeability surrounding subcritical experiments. - Developed an atomistic model that predicts the structure of metal films on crystalline oxide surfaces. - Established that thin tantalum nitride films on sapphire substrates currently used for weapon microelectronics are susceptible to fracture along the film-substrate interfaces. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Evaluate new, more efficient salt fabrication technology for transfer to the Y-12 plant. - Continue experimentation to define the effects of niobium concentration inhomogeneity with specific interest in the changes in dynamic mechanical properties. - Determine causes of degradation to ferroelectric thin-film properties that occur during process integration of films with microelectronic and micromechanical devices in an effort to improve ability to integrate ferroelectric thin films for unique applications, such as on-chip chemical sensors and tunable radars. - Analyze crack growth, fracture processes and mechanisms controlling hydrogen-induced failure to determine safety margins for gas transfer components. - Investigate possibility of using x-ray imaging plates for areal detection of x-rays to enable phase mapping with a 10 fold increase in speed. - Investigate theory that performance of shaped charge liners can be improved with grain boundary engineering. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Experimentation will continue to define the effects of niobium concentration inhomogeneity with specific interest in the changes in dynamic mechanical properties as a function of the expected deleterious oxidation and hydride potential with decrease of niobium alloy content. - Develop a microstructural model of long-term crack propagation in ceramics. - Demonstrate a direct fabrication process with metals which produces parts with complex shapes in three dimensions. - Develop materials and fabrication techniques for drastically reduced volume thermal batteries. - Develop fabrication processes for micron to nanoscale sized materials structures for microelectromechanical components. - Complete full production parallel code on Meiko CS-2 and Cray T3D, including preprocessing software, and combiner parallel consolidation for visualization on workstations, and million zone animations.
<p>FUNDING LEVELS:</p> <p>\$15,765</p>	<p>\$15,200</p>	<p>\$16,175</p>

HIGH EXPLOSIVES: Involves fundamental physics and chemistry of explosive materials, characterization and modeling of explosive properties, improvement of firing technology, investigation of demilitarization technologies, and engineering of explosive component prototypes and their evaluation for weapons use. Achieving an optimal balance between safety and performance is the major goal of these activities which seek to provide more powerful insensitive high explosives (IHE) highly resistant to unintentional detonation, detonation systems that offer improvements in safety, and answers to questions about the effects of aging on high explosives in stockpiled weapons.

MEASURABLE PERFORMANCE ACTIVITIES (Chemistry and Materials Science & Technology/High Explosives Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Developed a time-resolved Raman scattering technique for shock initiation studies with a two stage gas gun, a technique crucial for understanding shock initiation and HE sensitivity. - Measured the Hugoniot and temperature and burn products of nitromethane at single and reshock states to provide data basis for hydrocode equations of state. - Investigation of low speed impact initiation of conventional high explosives has successfully combined experiments, modeling, and theory to begin to understand and predict initiation under these conditions. - Made progress in predictive capability of initiation of HE under slow heat or impact conditions. - Developed Detonation Shock Dynamics theory to describe the evolution of multidimensional shock surfaces and was combined with level set theory. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Develop an improved shock initiation model for multiple shock scenarios. - Conduct research in cookoff reaction violence characterization. - Install and test a multi-axis machining cell for high explosives research at LANL. - Carry out a feasibility study for "sniffing" as a means to detect incipient aging in high explosives and develop that technique should it prove highly feasible. - Develop and complete models of high explosive microstructure stability and catalogue that stability as a function of aging in stockpile models that relate age-induced changes in high explosive structure and performance. - Continue detonation front curvature measurements to unify the current system of relating curvatures to reaction zone lengths. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Complete installation of a 5 Beam Fabry Perot Laser System in the 10Kg firing area of LLNL's Site 300. - Begin to assess the feasibility of using the SMPE "dip stick" technique for real-time measurement of organic decomposition in weapons and begin to instrument a weapon "test bed." - Develop a model for damage characterization. - Continue progress towards finalization of a cookoff reaction violence model. - Produce prototype parts with the high explosive machining cell.
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FUNDING LEVELS:

\$13,985	\$13,825	\$14,393
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SPECIAL NUCLEAR MATERIALS: Advanced and automated plutonium processing, casting, dynamic plutonium testing, and machining technologies. This research supports an enhanced understanding of the physical, mechanical, chemical and thermodynamic properties of the actinides. Understanding actinide properties is fundamental to the development of environmentally benign fabrication, disassembly, handling, and storage capabilities. Continued development of these process technologies will improve weapon safety, facilitate monitoring as the stockpile ages, and reduce both waste generation and worker exposure.

MEASURABLE PERFORMANCE ACTIVITIES (Chemistry and Materials Science & Technology/Special Nuclear Materials):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Developed experimental techniques to determine the amount of helium ingrowth during the aging of plutonium. - Developed precision density measurement techniques for plutonium through the application of gas picnometry that resulted in significantly improved accuracy and the elimination of an environmentally hazardous waste stream. - Defined continuous cooling transformation kinetics for pure uranium and the microalloyed uranium-vanadium systems. - Disassembled/disposed excess pits from the Rocky Flats Plant. - Continued test activities for the Plutonium Precision Die Casting Program to develop and demonstrate a "near-net-shape" casting process with a significant reduction in radioactive waste and worker-radiation exposure. - Successfully cast several high-precision weapon parts with minimal production of machine waste. Parts were made within a few tenths of a mil of specification. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Plutonium alloy atomic structure measurements will be continued. Focus will be on defining the nature of atomic bonding ideally prepared alloys to establish a baseline for measuring aging effects. - Uranium characterization studies will be expanded to evaluate the increased carbon concentrations within production materials and the further increases induced by anticipated production application of material recycle. - Support the recovery, packaging, and shipping of plutonium from over 20 excess pits currently stored at the Rocky Flats Plant to LANL. - Continue the Precision Die Casting Program activities leading to a production-ready process for casting of minimal-waste weapon parts. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> -Continue to support the recovery, packaging, and shipping of plutonium from excess pits currently stored at the Rocky Flats Plant to LANL. -Support plutonium immobilization and disposition program activities. - Fabricate a number of plutonium parts required for Stockpile Stewardship test activities. Fabrication will include casting, rolling, and machining activities. - Extend plutonium alloy atomic structure measurements to aged materials. - Prepare improved uranium constitutive models for inclusion into the weapons design codes and the weapons requalification/remanufacture specification basis.
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FUNDING LEVELS:

\$29,154	\$29,530	\$27,821
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TRITIUM: Material science research relevant to the production, disassembly, handling, and use of tritium and its compatibility with other materials and components. There are currently four broad areas of study in tritium research: gas transfer systems, solid storage systems, neutron generator tubes, and inertial fusion targets. Tritium is an essential material in nuclear weapons and a proposed fuel for inertial fusion targets. The design, production, and fielding of gas transfer systems involve issues in material characterization, performance modeling, and aging phenomena.

MEASURABLE PERFORMANCE ACTIVITIES (Chemistry and Materials Science & Technology/Tritium Detail):

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Provided significant support for pre-D&D tritium removal activities at EG&G Mound by receiving the first shipments of R&D storage vessels for tritium recovery and final disposition. - Completed the Tritium Inventory Removal Project. - Approved the new Function Tester at the Weapons Engineering Tritium Facility (WETF) for operation to support development of W76 boost system. - Processed an AL-M1 tritiated water container with 2 kg of tritiated water with the new Palladium Membrane Reactor tritium recovery technology. - Established a cooperative agreement between LANL and the Savannah River Site for joint projects. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Implement Phase II additions to the Function Tester to support real time mass spectroscopy, environmental conditioning, and laser drilling. - Qualify a pinch welder for welds safe for use with tritium. - Begin to remove the tritiated salts line in preparation for closing down the Tritium Salt Fabrication Facility, LANL. - Complete construction, test and operate the Tritium Supply and Delivery Station., at the LLNL tritium facility. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Continue assisting EG&G Mound in removal of tritium inventory and D&D planning. - Load neutron tube tritium targets at the Weapons Engineering Tritium Facility (WETF). - Support the filling of W87 ACORNS at WETF.
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FUNDING LEVELS:

\$6,300	\$7,314	\$3,441
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STOCKPILE COMPUTATION AND MODELING: Supports the development, enhancement, and maintenance of simulation codes and databases for the weapons program and research in theoretical physics, mathematical modeling, software and algorithms. With the President's decision to pursue a Zero-yield Comprehensive Test Ban Treaty, computational simulation of nuclear events has become the critical core element of weapon predictive capability and science-based Stockpile Stewardship. These activities are essential in weapon safety and reliability assessments, stockpile life extension endeavors, design of physics experiments, developing appropriate diagnostics, and analyzing past nuclear experimental results. Areas of current interest include: assessments of complex/unique accident scenarios; improvements of predictive capability for weapon safety and performance analysis, particularly in support of science-based Stockpile Stewardship; improvement in weapon materials dynamic response models; multi-dimensional simulation of physics; visualization tools; and robotics algorithms. Core Stockpile Computation and Modeling is managed to be consistent with, and supportive of, developments achieved through the Accelerated Strategic Computing Initiative (ASCI). Ongoing activities include hardware and software maintenance; computer operations; system administration, support and integration; configuration and resource management; computer security; local upgrades to operating systems and utility software. System networks will continue to be upgraded to enhance data transfer speeds and data storage continue to expand as technology for high density storage advances.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Explore concepts and technologies that offer options for meeting future national security requirements and missions.
- Support basic weapons physics research for components, radiation source development, improved diagnostics, and facilities.
- Support the development and maintenance of simulation codes for research in physics, mathematical modeling, and software.
- Transition into the weapon production activities the tools and methodologies developed under the ASCI program.

Change from FY 1997: Continue at the approximate FY 1997 level of effort in ongoing laboratory computing activities.

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Created a toolkit that simplifies scientific model development on parallel computing platforms and clusters of computers. - Identified a closed system of equations as a basis for further research, and developed, implemented, and tested a numerical differencing scheme for these equations in a hydrodynamic research code. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Develop MP eigensolvers for full-system linear structural dynamics modeling of weapon system response to normal and hostile environments. - Develop multicast environments, including applications, toolkits for building multicast applications, and the infrastructure for supporting multicast application in collaborative engineering and manufacturing environments, to provide enabling technologies for enterprise integration in the nuclear weapons complex. - Laboratory networks will be upgraded as technology becomes available to allow scientific visualization driven by ASCI deliverable to be extended to desktops. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Develop parallel algorithms for couples micro-/macro-scale computational models to predict aging effects on weapon component materials. - Create tools to allow for transitioning to the security scheme for distributed object-oriented systems and to integrate access-control methods based on secure distributed objects and access-control methods that use standard firewalls.
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FUNDING LEVELS:

\$112,647	\$155,145	\$151,500
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CORE STOCKPILE STEWARDSHIP-CORE RESEARCH & ADVANCED TECHNOLOGY-Computations and Modeling

TESTING CAPABILITIES AND READINESS: The primary purpose of the Nevada Test Site (NTS) is to provide a continental U.S. site for nuclear weapons testing. Consistent with Presidential direction, Defense Programs is required to maintain a readiness capability to conduct an underground nuclear test at the NTS. In addition to maintaining the appropriate infrastructure and personnel knowledge and skills to meet this requirement, measures are to be taken to assure continued environmental, health worker and public safety, and physical protection. Presidential direction also provides that resources should be included to conduct experimental activities planned by the nuclear weapon design laboratories, and appropriate to the national nuclear test policy, such as stockpile stewardship high explosive driven experiments. The annual maintenance of readiness activities requires Defense Programs to maintain the physical infrastructure including buildings and structures, electrical power transmission and distribution lines, roadways, environmental and security activities, water wells and associated supply and distribution lines, and electronic communications systems including computers, alarms, and telephone systems; and general site security including onsite law enforcement, intruder prevention and interception, and real property protection. Capital equipment and general plant projects funding necessary to support this activity are included in this category.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Maintain the infrastructure of the Nevada Test Site to allow its use by various Department of Energy programs,
- Maintain the skills, technologies, and environment, safety and health certifications necessary to allow a resumption of underground nuclear testing, per Presidential direction,
- Support experiments at the Nevada Test Site which provide benefit to the ongoing laboratory Stockpile Stewardship programs while helping to maintain the NTS readiness posture.

CHANGE FROM FY 1997: Supports four subcritical experiments and the Nuclear Test Readiness posture; however, the decrease may impact other Nuclear Test Readiness activities.

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Conducted MONARCH-B, a readiness exercise coupled with a routine REBOUND signal dry-run. Exercised the arming, firing, timing and control systems at the U1a Complex; the Test Control Center activities at CP-1, including an emergency preparedness inject/exercise; and reentry procedures at the Diagnostic Trailer Park (U1g) and at U1a. - Proceeded with construction and experiment diagnostic development for the REBOUND and HOLOG experiments. - Conducted the 206th and 207th Containment Evaluation Panels to review the potential QUARTZITE and MEXIA events. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Conduct NTS field activities for two subcritical experiments: REBOUND and HOLOG. Proceed with construction and diagnostic development support for the FY 1998 subcritical experiments. - Conduct VENTEX 97, an exercise simulating a containment failure of an underground nuclear test and designed to ensure effective on- and off-site emergency response actions in a timely manner. - Obtain approval to begin to operate the Device Assembly Facility to support subcritical experiments and other activities. - Conduct Containment Evaluation Panels for two hypothetical test emplacements. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Conduct NTS field activities for four subcritical experiments: ASH, ICEBOUND, BEECH, and BOOMERANG. Proceed with construction and diagnostic development support for the FY 1999 subcritical experiments. - Continue to support the archiving of the knowledge and experience of the uniquely-skilled NTS personnel, procedures and capital resource requirements that has been underway since FY 1995. Through the archival process, it is hoped that these important details may be captured and documented for future use should the U. S. return to underground nuclear testing.
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FUNDING LEVELS:

\$166,767	\$161,620	\$157,002
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Weapons Stockpile Stewardship - **CORE STOCKPILE STEWARDSHIP**

LABORATORY CAPITAL EQUIPMENT is required by the three national laboratories to maintain the capabilities necessary for stockpile maintenance, safety activities, and laboratory site infrastructure. Funding in this category supports multiple laboratory programs or is of a basic infrastructure nature and therefore cannot be allocated to other Stockpile Stewardship operations and maintenance categories.

FUNDING LEVELS:

\$33,294	\$30,349	\$27,527
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GENERAL PLANT PROJECTS are low cost construction projects (less than \$2 million) required to maintain the infrastructure and ongoing Stockpile Stewardship programs of the three laboratories. Funding for Nevada Test Site general plant projects is included in the Testing Capabilities and Readiness category. Although funded as an operations and maintenance expense, these projects are generally not allocated to specific program mission lines.

FUNDING LEVELS:

\$8,100	\$7,440	\$8,875
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CORE STEWARDSHIP CONSTRUCTION funding is shown for FY 1996 and FY 1997 only; funding for FY 1998 construction line items are shown in the Defense Fixed Asset account. Detailed information on construction line items can be found in the Construction Data Sheets following the Stockpile Stewardship budget narrative.

FUNDING LEVELS:

\$82,505	\$88,337	\$0
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WEAPONS STOCKPILE STEWARDSHIP INERTIAL CONFINEMENT FUSION

PROGRAM MISSION:

The mission of the Inertial Confinement Fusion (ICF) program is twofold: (1) to address high energy density physics issues as a key component of the science-based Stockpile Stewardship program, and (2) to develop a laboratory microfusion capability for defense and energy applications. The near-term goals pursued by the ICF program in support of this mission are demonstrating ignition in the laboratory and expanding the program's capabilities in high energy density science. The National Ignition Facility (NIF) is the cornerstone of this effort.

The program contributes to the goals of the Weapons Stockpile Stewardship program by:

- providing facilities and capabilities needed to study many of the basic and applied science issues underlying stockpile stewardship;
- conducting experiments to validate and verify the advanced weapons simulation codes being developed by the core nuclear weapons program and the Accelerated Strategic Computing Initiative (ASCI) to assess the reliability and effects of aging on weapons in the stockpile;
- providing calculational techniques to model high energy density phenomena in new simulation codes; and
- helping to retain the high quality of scientific and technical expertise necessary for national security.

TECHNICAL BACKGROUND:

ICF focuses energy from a "driver," typically a laser or ion beam accelerator, to implode and compress a small, spherical capsule shell containing deuterium and tritium (DT) fuel. The "inertia" of the compressed fuel keeps the reactants together long enough, under the proper conditions, for the fusion ignition and burn to occur. The goal is to achieve "gain," that is, to get more energy out of the system than was put into the system. The ICF capsule can be imploded in one of two ways: direct or indirect drive. In the direct drive approach, the driver energy is focused directly onto the capsule to drive the implosion. In the indirect drive approach, the driver energy is directed into a radiation enclosure, or hohlraum, generating a bath of soft x-rays which then drives the capsule. In either case, the irradiation energy is absorbed in the capsule's outer ablator layer. The heated ablator material rapidly blows off. The rocket-like reaction force causes the "pusher" and the remaining portion of the fuel capsule to spherically implode, compressing and heating the DT fuel to ignition.

The ICF program has developed unique capabilities in pursuit of its national mission. The laser and pulsed power facilities developed under the ICF program, along with associated diagnostic, modeling, and target fabrication components, are the most advanced array of high energy density physics research capabilities in the world. These facilities support science based stockpile stewardship while advancing inertial fusion technology toward a laboratory ignition demonstration with multi-megajoule fusion yields. Over the next five years, most of the ICF resources are allocated to an integrated theoretical and experimental program (high energy density physics studies, target fabrication, laser science, computation) to advance the technology in support of achieving ignition. Demonstration of ignition and burn in the laboratory is the goal of the National Ignition Facility (NIF), which will use glass laser technology and is planned to be completed in FY 2003.

WEAPONS STOCKPILE STEWARDSHIP - INERTIAL CONFINEMENT FUSION (continued)

GOALS:

- Demonstrate fusion ignition in the laboratory.
- Provide access to physics regimes of interest in nuclear weapon science and investigate physics issues.
- Expand the aboveground simulation capability for nuclear weapons effects.
- Develop diagnostic instruments applicable to weapons stockpile stewardship research.
- Develop and experimentally benchmark computational models by developing three-dimensional simulation capabilities.
- Attract and retain highly competent scientists and engineers within the nuclear weapons program.

PROGRAM FACILITIES:

- **Beamlet:** a scientific prototype of one beam of the NIF located at LLNL . It began operating experiments in 1994.
- **National Ignition Facility (NIF):** a 192-beam neodymium (Nd) glass laser to be built at Lawrence Livermore National Laboratory (LLNL) and scheduled for completion in FY 2003. A decision to begin physical construction is scheduled to be made by the Department in mid-March 1997.
- **Nike:** a Krypton-fluoride (KrF) laser located at the Naval Research Laboratory (NRL). It was completed in FY 1995 and will be used primarily to define beam smoothness requirements for direct drive laser fusion.
- **Nova:** a ten-beam glass laser located at LLNL. It is the program's major facility for research on indirect drive laser fusion, and has also made important contributions to stockpile stewardship and basic experiments on high energy density physics. This facility has been operating since 1985.
- **Omega:** a 60-beam glass laser used primarily for research on direct drive laser fusion located at the University of Rochester's Laboratory for Laser Energetics (UR/LLE). This facility was upgraded beginning in FY 1991 and began operating in May 1995.
- **Particle Beam Fusion Accelerator (PBFA):** a pulsed power machine used for light ion and inertial fusion research, located at Sandia National Laboratories (SNL). As of October 1996, it has been configured as a z-pinch device ("PBFA-Z") for use in weapons physics and ignition related experiments.
- **Trident:** a smaller glass laser facility at Los Alamos National Laboratory (LANL) used for diagnostic testing and development, as well as weapons and basic physics experiments.

SIGNIFICANT ACCOMPLISHMENTS AND PROGRAM SHIFTS:

FY 1996: Began the first year of line item construction activities for NIF, including Title I preliminary design of the laser, target area, integrated computers and controls, and optical components. Made important progress in laser and optics technology development for NIF, including developing a new technique for rapid growth of KDP conversion crystals. Measured equation of state of deuterium using the Nova laser in pressure regimes previously unaccessed. Demonstrated the world's highest neutron yield from inertial fusion on Omega. Conducted indirect drive experiments on Omega consistent with Nova results.

FY 1997: Completed Title I design of NIF in November 1996; selected LLNL as the site for NIF on December 19, 1996; and, initiated Title II design. NIF site preparation is planned to start following the Department's scheduled decision in March 1997, and critical laser and optics technology development for NIF will continue. Demonstrated world record x-ray production (1.8 Megajoules) using PBFA-Z; and quantified importance of laser nonuniformities for direct drive using the Nike laser. Tests are planned on Nova of indirect drive implosion symmetry using smooth laser beams; direct drive physics experiments will continue on Omega; and fabrication of a significant number of major components for the Omega cryogenic target handling system will be completed.

FY 1998: The FY 1998 request provides a modest increase to the base ICF program to cover NIF optics pilot production and full operational costs of the Omega laser. In addition, a new university/private sector grant program is initiated.

WEAPONS STOCKPILE STEWARDSHIP - INERTIAL CONFINEMENT FUSION (continued)

BUDGET STRUCTURE:

The Inertial Confinement Fusion program is presented in a new structure in order to better reflect the current priorities and future direction of the ICF program. The previous structure focused on driver technology, which is just one aspect of the program. Target physics is the basis for fusion ignition in the laboratory and it encompasses many of the same issues and techniques involved in analysis of nuclear weapon performance. Target physics issues, and the theory and modeling activities associated with these issues, are also the basis for the various experimental campaigns that are carried out on the ICF facilities. Therefore, we feel that the following new set of budget categories allows us to more accurately explain and describe the full range and importance of the activities supported by the ICF program:

- **TARGET PHYSICS, THEORY, & MODELING** supports target physics experimental activities that are directed at resolving target physics issues on both indirect and direct drive, including laser imprinting and hydrodynamic instability growth. It includes activities related to ignition, as well as weapons physics experiments.
- **TARGET DEVELOPMENT, FABRICATION & HANDLING** supports research, development, fabrication and delivery of non-cryogenic and cryogenic targets, engineering and tritium testing of the Omega cryogenic target handling system, development of technology and materials for target chambers, and diagnostics development.
- **LASER AND OPTICS TECHNOLOGY DEVELOPMENT** supports development of glass laser and related technology for the NIF, including multi-pass amplification schemes, beam smoothing, laser light conversion, glass and optics manufacturing techniques, and laser power conditioning capabilities.
- **NATIONAL IGNITION FACILITY - OTHER PROJECT COSTS** supports the operations and maintenance funded activities that are directly related to the NIF, including research and development necessary to complete construction, conceptual design, NEPA documentation, and other project related costs.
- **ADVANCED DRIVER DEVELOPMENT** supports experimental activities on pulsed-power accelerators, advanced glass laser concepts such as diode pumped solid state lasers, and other advanced ICF driver concepts needed for the future.
- **OTHER ICF ACTIVITIES** supports independent technical review (e.g. National Academy of Sciences), the National Laser Users Facility, and other user activities such as an individual investigator grant program in high energy density science relevant to ICF.
- **NIF - CONSTRUCTION PROJECT** (96-D-111) provides line item funding for the Total Estimated Cost (TEC) of the National Ignition Facility. Funding for the remaining TEC of NIF will be requested in the Defense Assets Acquisition account in FY 1998.

A table crosswalking funding from the previous budget categories to the new categories is provided for FY 1996, FY 1997, and FY 1998.

FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
 WEAPONS STOCKPILE STEWARDSHIP
 INERTIAL CONFINEMENT FUSION
 PROGRAM FUNDING PROFILE
 (Dollars in Thousands)

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Change from FY 1997</u>
Operations & Maintenance				
Target Physics, Theory, and Modeling	83,384	86,507	86,691	184
Target Development, Fabrication and Handling	32,137	30,732	30,654	(78)
Laser and Optics Technology Development	46,672	46,687	55,118	8,431
National Ignition Facility - Other Project Costs	23,600	59,200	31,300	(27,900)
Advanced Driver Development	15,476	8,776	8,634	(142)
Other ICF Activities	<u>2,242</u>	<u>2,658</u>	<u>4,603</u>	<u>1,945</u>
Total Operations & Maintenance	203,511	234,560	217,000	(17,560)
NIF Construction	<u>37,400</u>	<u>131,900</u>	<u>0</u> a/	<u>(131,900)</u>
TOTAL INERTIAL CONFINEMENT FUSION	<u>240,911</u>	<u>366,460</u>	<u>217,000</u>	<u>(149,460)</u>

a/ Funding for NIF construction is requested in the Defense Asset Acquisition account in FY 1998.

FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
 WEAPONS STOCKPILE STEWARDSHIP
 INERTIAL CONFINEMENT FUSION
 FUNDING PROFILE BY SITE
 (Dollars in Thousands)

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Change from FY 1997</u>
BASE PROGRAM				
Lawrence Livermore National Laboratory	87,486	84,632	91,000	6,368
Los Alamos National Laboratory	22,837	21,894	22,100	206
Sandia National Laboratory	27,481	26,037	26,000	(37)
University of Rochester/Laboratory for Laser Energetics	20,848	21,799	23,600	1,801
General Atomics	11,369	10,360	10,500	140
Naval Research Laboratory	8,500	9,000	9,000	0
Argonne National Laboratory	0	0	0	0
Oakland Operations Office	1,014	900	700	(200)
Headquarters/Other	376	738	2,800	2,062
TOTAL BASE PROGRAM	179,911	175,360	185,700	10,340
NATIONAL IGNITION FACILITY				
Lawrence Livermore National Laboratory	55,900	187,010	31,300	N/A
Los Alamos National Laboratory	1,051	1,000	0	N/A
Sandia National Laboratory	2,568	3,000	0	N/A
University of Rochester/Laboratory for Laser Energetics	175	90	0	N/A
General Atomics	0	0	0	N/A
Naval Research Laboratory	0	0	0	N/A
Argonne National Laboratory	1,250	0	0	N/A
Oakland Operations Office	0	0	0	N/A
Headquarters/Other	56	0	0	N/A
TOTAL NIF	61,000	191,100	31,300	a/ N/A
TOTAL INERTIAL CONFINEMENT FUSION	240,911	366,460	217,000	N/A

a/ Funding for NIF construction is included in this account for FY 1996 and FY 1997, but is requested in the Defense Asset Acquisition account in FY 1998. The amount included in this account for FY 1998 represents O&M, Other Project Costs only.

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**WEAPONS STOCKPILE STEWARDSHIP
INERTIAL CONFINEMENT FUSION
Budget Structure Crosswalk
(Dollars in Thousands)**

FY 1996	Previous Budget Categories								
New Budget Category	Indirect Drive w/ Glass Laser	Direct Drive w/Glass Laser	Krf Laser	Light Ion Beams	Capsule Fabrication & Development	Other	NIF Other Project Costs	Construction	Total
Inertial Confinement Fusion - O & M									
Target Physics, Theory, and Modeling	48,001	15,495	8,500	11,388					83,384
Target Development, Fabrication and Handling	13,168	1,820		417	16,732				32,137
Laser and Optics Technology Development	41,592	3,080		2,000					46,672
National Ignition Facility - Other Project Costs							23,600		23,600
Advanced Driver Development	1,800			13,676					15,476
Other ICF Activities	399	453				1,390			2,242
NIF Construction								37,400	37,400
TOTAL ICF	104,960	20,848	8,500	27,481	16,732	1,390	23,600	37,400	240,911

FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
WEAPONS STOCKPILE STEWARDSHIP
INERTIAL CONFINEMENT FUSION

Budget Structure Crosswalk

(Dollars in Thousands)

FY 1997	Previous Budget Categories								
New Budget Category	Indirect Drive w/ Glass Laser	Direct Drive w/Glass Laser	Krf Laser	Light Ion Beams	Capsule Fabrication & Development	Other	NIF Other Project Costs	Construction	Total
Inertial Confinement Fusion - O & M									
Target Physics, Theory, and Modeling	44,362	16,440	9,000	16,705					86,507
Target Development, Fabrication and Handling	11,728	2,522		500	15,982				30,732
Laser and Optics Technology Development	42,547	2,340		1,800					46,687
National Ignition Facility - Other Project Costs							59,200		59,200
Advanced Driver Development	1,744			7,032					8,776
Other ICF Activities	523	497				1,638			2,658
NIF Construction								131,900	131,900
Total ICF	100,904	21,799	9,000	26,037	15,982	1,638	59,200	131,900	366,460

FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
WEAPONS STOCKPILE STEWARDSHIP
INERTIAL CONFINEMENT FUSION

Budget Structure Crosswalk

(Dollars in Thousands)

FY 1998	Previous Budget Categories								
New Budget Category	Indirect Drive w/ Glass Laser	Direct Drive w/Glass Laser	Krf Laser	Light Ion Beams	Capsule Fabrication & Development	Other	NIF Other Project Costs	Construction	Total
Inertial Confinement Fusion - O & M									
Target Physics, Theory, and Modeling	43,502	17,950	9,000	16,239					86,691
Target Development, Fabrication and Handling	10,893	2,625		961	16,175				30,654
Laser and Optics Technology Development	50,868	2,450		1,800					55,118
National Ignition Facility - Other Project Costs							31,300		31,300
Advanced Driver Development	1,634			7,000					8,634
Other ICF Activities	528	575				3,500			4,603
NIF Construction								a/	0
TOTAL ICF	107,425	23,600	9,000	26,000	16,175	3,500	31,300	0	217,000

a/ Funding for NIF construction is requested in the Defense Asset Acquisition account in FY 1998.

TARGET PHYSICS, THEORY, AND MODELING: These activities include target physics experiments and theoretical modeling which address physics issues involving ignition target designs, hohlraum-laser interaction, laser-plasma instabilities, and hydrodynamic instabilities. Several approaches to ignition will be tested and modeled, improving confidence that ignition can be attained and enhancing both ignition and ignitionless experiments as laboratory tools. Issues of the redistribution of light within the target (hohlraum) and of compression of the capsule through interaction with radiation are scientifically challenging in detail and have commonality between laboratory ignition and weapon performances.

CHANGE FROM FY 1997: The FY 1997 level of effort is continued in FY 1998.

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996:</u> Completed Nova Technical Contract target physics symmetry/hydrodynamic activities and plasma physics experiments that contributed to the technical basis for the expectation of achieving ignition on the NIF.</p> <p>Developed integrated calculation of NIF ignition targets that employ full radiation transport.</p> <p>Conducted first cryogenic equation of state experiments on Nova.</p> <p>Developed a computer code to model laser plasma interaction and laser bending inside a target.</p> <p>Characterized large, long-lived vacuum hohlraums heated by the Saturn high power pinch sources, and demonstrated the utility of these sources for ICF and weapon experiments.</p> <p>Carried out theory, modeling and code development activities in support of ICF and Omega experiments, including detailed analysis of hydrodynamic instabilities critical to the success of direct drive.</p>	<p><u>FY 1997:</u> Demonstrate energetics and symmetry control with beam smoothing on 10 Nova beams and start symmetry control with beam phasing.</p> <p>Quantify the effects of 10-beam smoothing (KPP and/or SSD) on plasma-induced beam steering and radiation drive symmetry.</p> <p>Start moderate capsule convergence high instability growth implosions.</p> <p>Begin Petawatt physics experiments seeking higher energy densities in matter.</p> <p>Model ignition capsules ignition and burn in 3D.</p> <p>Using the foam-buffered direct drive technique on Omega, determine optimal foam properties for maximal spherical compression, and demonstrate laser imprint reduction in spherical implosions at 351 nm.</p> <p>Continue activities in support of ICF and Omega experiments, including study of hydrodynamic instability and development of a new 3D radiation-hydrodynamic code modeling capability.</p>	<p><u>FY 1998:</u> Complete symmetry control and high-convergence, high-growth experiments for capsule implosions.</p> <p>Start integrated fast ignitor experiments with Petawatt.</p> <p>Test 3D integrated modeling of NIF targets.</p> <p>Demonstrate low convergence, highly-symmetric implosions using indirect drive NIF-like 6 rings of laser illumination and evaluate non-cylindrical hohlraums suitable for Omega.</p> <p>Demonstrate and characterize the enhanced radiation intensity of an imploding z-pinch hohlraum. In this concept, current passing through a high-Z material creates an imploding hohlraum that heats a core material and generates and confines x-rays that can implode a fuel capsule.</p> <p>Continue activities in support of ICF and Omega experiments, including study of hydrodynamic instability and development of a new 3D radiation-hydrodynamic code modeling capability.</p>
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TARGET PHYSICS, THEORY, AND MODELING

MEASURABLE PERFORMANCE ACTIVITIES (Continued):

<p><u>FY 1996:</u> Commenced Omega experimental campaign aimed at defining physics requirements for direct drive ignition; implemented target diagnostics including x-ray backlighting; demonstrated highest DT neutron yield measured to date and capability to do indirect drive on Omega.</p> <p>Conducted experimental and theoretical studies aimed at quantifying the limits laser beam nonuniformities place on direct drive capsule performance; demonstrated an imprint level of 100 A using the smooth beams of the Nike laser.</p> <p>Conducted planar foil imprinting experiments which suggest that the perturbations caused by nonuniformities in the early laser beam energy deposition on target can be significantly reduced by SSD beam smoothing.</p> <p>Conducted indirect-drive experiments on Omega achieving neutron yields and radiation temperatures consistent with Nova results, demonstrating that Omega can be used for Nova-scale indirect-drive target experiments as well as for direct drive and replicating NIF geometry.</p>	<p><u>FY 1997:</u> Continue Omega experiments to address hydrodynamic and plasma physics issues under conditions relevant to NIF high performance direct drive targets; continue development and fielding of advanced target diagnostics; address indirect drive issues using Omega.</p> <p>Perform instability experiments in cylinders focusing on understanding nonlinear saturation of perturbation growth in experiments on the Omega facility.</p> <p>Continue experimental studies of effects of laser beam nonuniformity on Nike, including varying laser bandwidth and reducing Rayleigh Taylor instability growth in direct drive targets.</p> <p>Demonstrate the predicted scaling of vacuum hohlraum temperatures from Saturn to PBFA-Z current levels, and apply to proof-of-principle ICF experiments.</p> <p>Conduct a full range of planar foil target experiments to study Rayleigh-Taylor hydrodynamic instabilities in geometries and conditions relevant to NIF high-performance targets.</p>	<p><u>FY 1998:</u> Continue Omega experiments to address hydrodynamic and plasma physics under conditions relevant to NIF high performance direct drive targets; continue development and fielding of advanced target diagnostics; address indirect drive issues using Omega.</p> <p>Continue studies of laser beam nonuniformity effects on Nike, including experiments using cryogenic deuterium targets that better approximate the conditions in a direct drive ignition target.</p>
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FUNDING LEVELS:

\$83,384	\$86,507	\$86,691
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TARGET DEVELOPMENT, FABRICATION, AND HANDLING: Activities include the research, development, fabrication and delivery of various complex, well-characterized, indirect and direct drive targets and target components which meet stringent specifications. Various levels of effort are conducted at the five ICF laboratories (LLNL, LANL, SNL, UR/LLE, and NRL) and by the ICF target support contractor, General Atomics. An ICF target consists of a millimeter-scale, fuel-containing "capsule" which may be enclosed in a vacuum- or gas-filled radiation case called a "hohlraum;" mounted with a low-mass fiber web; or mounted in a low density foam-filled hohlraum. Also included are the engineering and tritium testing of the cryogenic target handling systems, including subsystems for gas filling, transportation, fuel layering, fuel layer characterization, and target insertion and positioning. Current ignition target designs require cryogenic fuel in the capsules. Technological challenges include: producing targets with cryogenic layers of sufficient smoothness and uniformity, maintaining targets at cryogenic temperature during transportation to target chamber center, and performing final alignment.

CHANGE FROM FY 1997: The FY 1997 level of effort is continued in FY 1998.

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996:</u> Developed prototype advance nuclear diagnostics and developed robust x-ray diagnostics.</p> <p>Experimentally demonstrated methods for improving surface smoothing of cryogenic DT layers beyond what is obtained by native beta layering to an unprecedented smoothness in a toroidal cell of 2 mm.</p> <p>Machined 1mm and 2mm diameter Be hemishells to NIF surface finish specifications. (Fixture for machine work is an R&D 100 Award candidate.)</p> <p>Developed, fabricated, characterized, and delivered 3,350 sophisticated, specialized targets and capsules.</p> <p>Continued to develop Omega cryogenic target system.</p>	<p><u>FY 1997:</u> Continue to prototype advance nuclear diagnostics and develop robust x-ray diagnostics.</p> <p>Begin conceptual development for fielding of cryogenic targets at NIF.</p> <p>Demonstrate cryogenic layering technology.</p> <p>Develop processes for bonding beryllium and beryllium alloy shells and characterize shells for surface finish and roundness.</p> <p>Develop, fabricate, characterize, and deliver targets needed for experimental programs at the five ICF laboratories.</p> <p>Continue development of Omega cryogenic target handling system for tritium capability.</p>	<p><u>FY 1998:</u> Test ablation protection schemes and beam dump design on Nova.</p> <p>Test advanced nuclear diagnostics on Nova and prototype robot x-ray diagnostics.</p> <p>Conceptual design of NIF cryogenic support and DT fill systems.</p> <p>Develop production techniques for Omega beryllium shells including fill procedures.</p> <p>Develop, fabricate, characterize, and deliver targets needed for experimental programs at the five ICF laboratories.</p> <p>Complete construction of the Omega cryogenic target system and perform full test at LANL.</p>
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FUNDING LEVELS:

\$32,137	\$30,732	\$30,654
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LASER AND OPTICS TECHNOLOGY DEVELOPMENT: These activities include development of the glass laser and related optics technology, such as multi-pass amplification schemes, beam smoothing, laser light conversion, glass manufacturing techniques, and laser power conditioning capabilities. This development is in support of the ICF program goals and NIF project.

CHANGE FROM FY 1997: Funding is increased by \$8.4 million to reflect the importance of completing the laser component and optics technology development program in support of NIF.

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996:</u> Tested prototype 4x2 amplifier modules.</p> <p>Developed new technique for rapid growth of KDP conversion crystals that incorporated increased supersaturation levels to speed crystal growth.</p> <p>Tested and built prototype of optical switch.</p> <p>Measured Beamlet performance with NIF pulse shape and temporal beam smoothing (1D-SSD).</p> <p>Constructed and operated full-scale continuous laser glass melter prototype.</p> <p>Validated laser, glass, and KDP/KD*P crystal, fabrication production processes.</p> <p>Implemented uniformity and pulse shaping improvements to the Omega laser system.</p>	<p><u>FY 1997:</u> Continue testing 4x2 amplifier modules.</p> <p>Continue work on rapid growth KDP crystals.</p> <p>Continue to test/ build optical switch.</p> <p>Continue Beamlet work on NIF pulse shape and temporal beam smoothing (1D-SSD).</p> <p>Continue work on full-scale continuous laser glass melter prototype.</p> <p>Continue to validate laser, glass, and KDP/KD*P crystal, fabrication production processes.</p> <p>Continue uniformity and pulse shaping improvements to the Omega laser system.</p>	<p><u>FY 1998:</u> Complete 4x2 amplifier module development and flashlamp lifetime testing.</p> <p>Complete pulse-power development.</p> <p>Validate NIF final optics assembly on Beamlet.</p> <p>Demonstrate reliable third harmonic performance of Beamlet at NIF specifications.</p> <p>Demonstrate full-scale automated optics leaving process, polarizer/mirror coating process, and NIF-fused silica boule geometry and production process.</p> <p>Continue uniformity improvements to the Omega laser system.</p> <p>Achieve high-dynamic range pulse shaping on Omega.</p>
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FUNDING LEVELS:

\$46,672	\$46,687	\$55,118
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NATIONAL IGNITION FACILITY (NIF) OTHER PROJECT COSTS: The NIF is an experimental inertial confinement fusion facility intended to achieve controlled thermonuclear fusion in the laboratory by imploding a small capsule containing a mixture of the hydrogen isotopes, deuterium and tritium. By producing ignition and modest energy gain in ICF targets, NIF will provide the capability to carry out experiments in regimes of plasma temperatures and densities similar to those in a nuclear weapon, thereby providing an important means for the program to satisfy its stewardship responsibilities. In addition, NIF can provide simulation capability to study nuclear weapon effects on strategic, tactical, and space assets; serve as a magnet program to retain and attract scientific and technical talent to Defense Programs to conduct leading-edge scientific research; and provide critical ignition data to enable the development of civilian inertial fusion energy.

This activity includes the operations and maintenance (O&M) activities directly related to the NIF such as: research and development necessary to complete construction; conceptual and advanced conceptual design; environmental documentation; optics vendor facilitization and optics quality assurance; engineering studies of project options; startup planning, management, training and staffing; procedure preparation; operational readiness reviews; and operating spares. These Other Project Costs (OPC) plus the Total Estimated Cost (TEC) equals the Total Project Cost (TPC) for the NIF. In FY 1998, the remaining construction costs for the project (TEC) will be requested in the Defense Assets Acquisition account. Additional details about the project can be found in the NIF Project Data Sheet that follows the Weapons Stockpile Stewardship budget narrative.

CHANGE FROM FY 1997: The \$27.9 million decrease reflects the completion of optics vendor facilitization activities.

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996:</u> Initiated optics facilitization to develop and implement improvements at optics vendors to enable cost-effective production of NIF optical components.</p> <p>Completed the NIF Project Specific Analysis (full NEPA documentation for NIF) in support of the Stockpile Stewardship and Management Programmatic Environmental Impact Statement.</p> <p>Supported other project activities including, preparation of the Preliminary Safety Analysis Report, facility operational start-up planning, assurances, engineering studies of project options (advanced conceptual design) and project start-up/integration activities.</p>	<p><u>FY 1997:</u> Continue vendor facilitization in support of required optical materials.</p> <p>Continue ongoing project activities including, completion of the Preliminary Safety Analysis Report, preparation of necessary environmental permits and assurances, facility operational start-up planning, and project start-up/integration activities.</p>	<p><u>FY 1998:</u> Complete vendor facilitization in support of required optical materials and conduct required optics quality assurance activities.</p> <p>Continue other ongoing project activities including, preparation of necessary environmental permits and assurances, and facility operational start-up planning.</p>
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FUNDING LEVELS:

\$23,600	\$59,200	\$31,300
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Inertial Confinement Fusion- NIF Other Project Costs

ADVANCED DRIVER DEVELOPMENT: These activities include experiments conducted on pulsed-power accelerators, the development of gas lasers as an alternative wavelength laser technology, and advanced glass laser concepts such as diode pumped solid state lasers. Gas lasers are maintained in part because of their inherent smoothness that could be important for direct drive. For higher yield capability or higher repetition rate, fusion drivers need greater average power and higher efficiency. Development of these attributes is the objective of driver development.

CHANGE FROM FY 1997: The FY 1997 level of effort is continued in FY 1998.

MEASURABLE PERFORMANCE ACTIVITIES:

<u>FY 1996:</u> Carried out experiments on PBFA to examine light ion beam production and transport using a new extraction-diode geometry. Continued efforts aimed at developing a high yield inertial fusion facility based on a diode pumped solid state laser or a heavy ion driver.	<u>FY 1997:</u> Conduct extraction-diode experiments on Sabre and compare results with three-dimensional computer simulations. Develop an active spectroscopy probe to understand the physics of ion diode behavior. Continue efforts aimed at developing a high yield inertial fusion facility based on a diode pumped solid state laser or a heavy ion driver.	<u>FY 1998:</u> Continue Sabre experiments and comparison with QUICKSILVER modeling. Continue evaluation of diode pumped solid sate laser and heavy ion based approaches to high gain inertial fusion.
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FUNDING LEVELS:

\$15,476	\$8,776	\$8,634
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OTHER ICF ACTIVITIES: These activities include support for the National Laser Users Facility, laboratory or Headquarters sponsored user programs, outside reviews (such as the National Academy of Sciences), and independent technical support. These activities will generally broaden the high energy density science field, foster independent researchers in high

energy density science, and train students for careers in the high energy density field.

CHANGE FROM FY 1997: Increase reflects the beginning of a new investigator grant program in high energy density science relevant to ICF.

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996:</u> Competitively awarded seven new grants to qualified outside researchers to conduct basic experimental research in high energy density physics, laser-matter interactions, and other scientific areas at the NLUF located at the University of Rochester/Laboratory for Laser Energetics.</p> <p>Initiated an independent review of the ICF program by the National Academy of Sciences to determine: (1) the scientific and technical readiness of the NIF project to proceed with construction, (2) adequacy of the ICF program in addressing the confidence of achieving ignition and providing the technical basis associated with NIF performance, and (3) projected capabilities of the NIF to support science-based stockpile stewardship.</p> <p>Ongoing university use of ICF facilities and collaborations with researchers.</p>	<p><u>FY 1997:</u> Continue funding for the NLUF located at the University of Rochester/Laboratory for Laser Energetics.</p> <p>Continue support for the NAS review. The NAS report is due out on March 4, 1997.</p> <p>Ongoing university use of ICF facilities and collaborations with researchers.</p>	<p><u>FY 1998:</u> Continue funding for the NLUF located at the University of Rochester/Laboratory for Laser Energetics.</p> <p>Initiate university/private sector grant program for support of ICF-related experiments, diagnostics development, and modeling which are relevant to Stockpile Stewardship.</p> <p>Continue support for the NAS review.</p> <p>Ongoing university use of ICF facilities and collaborations with researchers.</p>
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FUNDING LEVELS:

\$2,242	\$2,658	\$4,603
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WEAPONS STOCKPILE STEWARDSHIP TECHNOLOGY TRANSFER AND EDUCATION

NOTE: Summary level funding information is included in the Weapons Stockpile Stewardship overview.

TECHNOLOGY TRANSFER: Technology Transfer (Technology Partnerships) operations and maintenance funding supports cooperative activities between the nuclear weapons complex and the private sector which provide dual benefits to the nuclear weapons program and U.S. industry. The majority of the activities are partnerships called Cooperative Research and Development Agreements (CRADA) which have been selected on the basis of their contribution to the advanced technology needs of the weapons complex, principally at the nuclear weapons laboratories and the weapons production plants at Oak Ridge and Kansas City. These technology partnerships are supportive of a number of Defense Programs Initiatives: the Advanced Design and Production Technologies Initiative (ADAPT) and core Stockpile Stewardship and Management objectives. Examples of other initiatives are: the American Textile Partnership for which the Conference on the FY 1997 Energy and Water Development Appropriation added \$10 million; the Partnership for a New Generation of Vehicles initiative; and the Advanced Computational Technology Initiative.

PROGRAM GOALS:

- Support the goals and initiatives of the Stockpile Stewardship and Management programs, particularly in the areas of manufacturing and advanced computing.
- Advance a broad range of critical weapons core competencies and programs.
- Continue industry partnerships, leveraging the vast resources of the private sector, to cost share the development of the best, most efficient and most affordable technologies needed to meet the objectives of the Stockpile Stewardship and Management programs.
- Support the Small Business Initiative, providing technology assistance and partnership agreements for businesses of less than 500 employees..

ONGOING RESPONSIBILITIES:

Funds will be distributed to the laboratories and weapons production facilities in accordance with their approved plans for industrial partnership projects and applied to the projects deemed to be the most important to mission-related competencies. The American Textile Partnership, the Advanced Computational Technology Initiative, and the Partnership for a New Generation of Vehicles initiative support dual-benefit work between the national laboratories. The Small Business Initiative will be continued at a reduced level. Projects in other areas include work on microelectronics, materials and advanced manufacturing.

CHANGE FROM FY 1997: The FY 1998 funding level, an increase of \$0.6 million over FY 1997, maintains the FY 1997 level of effort.

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996:</u> Redirected the program to provide stronger direct benefits to Defense Programs mission requirements; terminated lower priority projects; reduced scope and funding of remaining projects to support for the highest priorities in the key competency areas of the laboratories.</p> <p>Supported several high priority initiatives including the Partnership for a New Generation of Vehicles initiative, the American Textile Partnership, and the Advanced Computational Technology Initiative.</p> <p>Reengineered and redirected projects to deliver significant contributions to Stockpile Stewardship and Management Programs. Successful projects included:</p> <ul style="list-style-type: none"> - Demonstration of a complete product realization process to fabrication of a part with features of interest to the weapons complex the industrial partners. Technologies developed for the demonstration are now being used by the Sandia gas transfer system pilot test bed. - Production of enhanced finite element modeling tools to perform simulations for large-scale deformation problems previously intractable, improvement of models for simulating the behavior of polymers during manufacture of electronic components used in weapons, and experience with using analysis codes in a simulation-based design environment. - Development/implementation of the initial version of a multiple-phase material model for austenitic, low carbon steels. The model is the central part of a predictive capability for distortion, microstructure, and residual stresses resulting from carburizing heat treatment, widely employed throughout commercial and defense industries. 	<p><u>FY 1997:</u> Support mission-driven technology partnerships with industry that leverage and maximize industrial contributions to Defense Programs mission requirements. Projects supported will provide the most strategic benefits to Defense Programs and laboratory competencies.</p> <p>Continue to fund a significant portion of the Department's Partnership for a New Generation of Vehicles initiative, the American Textile Partnership, and the Advanced Computational Technology Initiative, which provide dual benefit, both to Defense Programs and industry.</p> <p>Refocus the Small Business Initiative to strengthen support for Defense Programs mission and provide support for technology development partnerships with regional companies.</p>	<p><u>FY 1998:</u> Focus resources on the highest priority partnerships supporting the national security mission. Areas of support will include:</p> <ul style="list-style-type: none"> - advanced manufacturing - materials and process technologies - enhanced surveillance - microelectronics - computing simulations <p>Continue to fund a portion of the Department's Partnership for a New Generation of Vehicles initiative, the American Textile Partnership, and the Advanced Computational Technology Initiative, which provide dual benefit, both to Defense Programs and industry.</p> <p>Support the Small Business Initiative with a specific focus on Defense Programs mission requirements.</p>
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FUNDING LEVELS:

\$149,000	\$59,400	\$60,000
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EDUCATION: The Education program provides funding utilizing the unique resources of the Department of Energy national laboratories -- people, programs, and facilities -- to improve science and math education throughout the Nation. Enhancing the scientific education of our citizens will ensure a highly trained, diverse scientific workforce for the laboratories and will enhance our ability to conduct the Stockpile Stewardship mission. The projects, approved by Headquarters and conducted by the Lawrence Livermore National Laboratory, Los Alamos National Laboratory, and Sandia National Laboratories, ongoing in nature or for a defined period, are grouped in six major categories: teacher/faculty enhancement, curriculum improvement, institutional improvement, student support, educational technology and public understanding of science. Each laboratory publishes an annual report on the projects and their accomplishments. Historically Black Colleges and Universities and other minority institutions receive approximately 15 percent of this funding.

PROGRAM GOALS:

Contribute to a systematic improvement in science, mathematics, engineering, and technology to enhance scientific and technical literacy and ensure a highly trained, diverse workforce.

CHANGES FROM FY 1997:

The FY 1998 program will continue at a reduced level of effort (\$-1 million) from FY 1997; however, increasing emphasis will be placed on graduate and post-graduate activities that have a direct tie to the Defense Programs mission and goals and the core competencies of the laboratories.

PERFORMANCE MEASURES:

All Defense Programs science education projects and activities are subject to the following required criteria developed by the Department of Energy/Defense Programs Science Education Task Force: consistent with Defense Programs mission; draws upon the national laboratories unique capabilities; meets an existing need; engages partners and collaborators, and leverages resources; cost effective; complements other science education initiatives; and complements private sector role(s). Desired criteria include the potential for national impact, the potential for long-term impact, the emphasis on underrepresented groups, and the contribution to a balanced program.

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Provided approximately 15 percent to underrepresented groups such as Historically Black Colleges and Universities and other minority institutions. - Developed a curriculum module at the Los Alamos National Laboratory on Radiation and Risk Assessment using laboratory experts in conjunction with local master teachers. -The National Ignition Facility for Teachers and Youth (NIFTY) developed a virtual tour of Nova to provide teachers and students with access to the facility and resource materials. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Emphasize high school/undergraduate/graduate level participants with priority on programs connected to core competencies of the laboratories. - Complete piloting/testing of Radiation Risk Assessment curriculum & prepare for broad dissemination. - Expand NIFTY effort to allow students/teachers to utilize the virtual tour and data from Nova to participate in laboratory research in their classrooms. - Emphasize collaborative research projects & internship opportunities such as advanced computing & materials. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Provide students and their teachers with opportunities to collaborate with laboratory scientists as an out-growth of the NIFTY curriculum development effort. - Disseminate nationwide a curriculum developed by laboratory scientists/master teachers that includes advanced visualization tools for atmospheric modeling developed at the Atmospheric Release Advisory Center. - Establish productive relationships with the military academies and the Naval Postgraduate School.
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FUNDING LEVELS:

\$10,000	\$10,000	\$9,000
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**DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
DEFENSE ASSET ACQUISITION**

**DEFENSE PROGRAMS
STOCKPILE STEWARDSHIP**

Beginning in FY 1998, all line item construction projects are included in the Defense Asset Acquisition account. Funding for FY 1996 and FY 1997 is reflected in the Stockpile Stewardship decision unit within Weapons Activities.

The FY 1998 request includes:

- Two new infrastructure revitalization subprojects, both within 96-D-102, Stockpile Stewardship Facilities Revitalization, Phase VI.
 - **Storm Drain, Sanitary Sewer, and Domestic Water Systems Modernization** (TEC: \$15.374 million) will refurbish ground water management systems at the Sandia Albuquerque site to address number of environmental and health issues.
 - **Site 300 Fire Station/Medical Facility** (TEC: \$5.35 million) will provide a new fire/medical facility at the Lawrence Livermore National Laboratory's Site 300, replacing the current facility which no longer meets code and is not able to provide adequate support for ongoing operations.
- The **138 kV Substation Modernization** subproject was a FY 1997 new start at the Nevada Test Site (NTS) with a TEC of \$28.149 million. Since the submission of last year's request, the project scope has been reviewed to insure that it is consistent with that necessary to meet the ongoing operations of the NTS. This review has lead to a significantly downscoped project with a new TEC of \$10.642 million.
- In FY 1997, the **Dual-Axis Radiographic Hydrotest Facility** at Los Alamos National Laboratory was removed as a subproject within project 88-D-106, Nuclear Weapons Research, Development & Testing Facilities Revitalization, Phase II. The new stand alone line item, 97-D-102, contains the entire scope of the project as outlined in the Record of Decision to the Environmental Impact Statement completed in FY 1995. The total FY 1998 request of \$46.3 million includes \$22 million to complete the first arm of the facility, as detailed in the FY 1997 data sheet, and \$24.3 million to complete engineering and design of the second (dual-axis) arm and begin the first phase of the containment effort outlined in the Environmental Impact Statement.

FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
DEFENSE ASSET ACQUISITION
WEAPONS STOCKPILE STEWARDSHIP
(Detail and Crosscut Dollars in Thousands)

CONSTRUCTION PROJECT SUMMARY

Project					Previous	FY 1996	FY 1997	FY 1998	FY 1999
Number	Project Title		TEC		Approp	Approp	Approp	Request	Request
CORE STOCKPILE STEWARDSHIP									
97-D-102	Dual-Axis Radiographic Hydrotest Facility, LANL	1/	186,700	\$	64,905	\$	16,495	\$	59,000
96-D-105	Contained Firing Facility Addition, LLNL		49,700			6,600	17,100	26,000	0
96-D-104	Processing & Environmental Technology Laboratory, SNL		45,900			1,980	2/ 14,100	29,820	0
96-D-103	Atlas, LANL		43,300			8,400	15,100	19,800	0
96-D-102	S. Stewardship Facilities Revitalization, Phase VI, Various Locations								
	Water Well Replacements, LANL		16,800			1,000	10,200	5,600	0
	Fire Protection Improvements, LANL		16,900			1,520	5,050	10,330	0
	Real Property Protection (Roofs), LLNL		7,810			0	3,000	4,810	0
	138 kV Substation Modernization, NTS		10,642			0	1,000	9,642	0
	Storm Drain, Sanitary Sewer & Domemstic Water, SNL		15,374			0	0	15,374	0
	Site 300 Fire Station/Medical Facility, LLNL		5,350			0	0	5,350	0
Subtotal, S. Stewardship Facilities Revitalization, Phase VI					0	2,520	19,250	51,106	0
95-D-102	CMR Upgrades Project, LANL		174,100		41,800	10,940	3/ 15,000	0 4/	0
94-D-102	NWRD&T Facilities Revitalization, Phase V, Various Locations								
	Power Systems Modernization, SNL		36,987		17,000	12,200	7,787	0	0
93-D-102	Nevada Support Facility, NVO		38,650		23,000	15,650	0	0	0
90-D-102	NWRD&T Facilities Revitalization, Phase III, Various Locations								
	Site 300 Revitilization, LLNL		27,400		22,100	5,300	0	0	0
	Electrical Power Systems Upgrades, LLNL		28,386		28,200	186	0	0	0
	Fiber Optic Backbone, LLNL		1,802		1,088	714	0	0	0
	Fully Funded Subprojects		16,821		46,821	0	0	0	0
Subtotal, NWRD&T Facilities Revitalization, Phase III, Various					98,209	6,200	0	0	0
88-D-106	NWRD&T Facilities Revitalization, Phase II, Various Locations								
	Defense Programs Research Facility, LLNL		72,640		71,140	1,500	0	0	0
	Fully Funded Subprojects		231,319		231,319	0	0	0	0
Subtotal, NWRD&T Facilities Revitalization, Phase II, Various					302,459	1,500	0	0	0
87-D-104	Safeguards & Seucrity Enhancements, Phase II, Various					20	0	0	0
New Start Construction Wedge					0	0	0	0	50,263
TOTAL, CORE STOCKPILE STEWARDSHIP				\$	547,373	\$	82,505	\$	109,263
INERTIAL CONFINEMENT FUSION									
96-D-111	National Ignition Facility, LLNL		1,045,700	\$	0	\$	131,900	\$	0
TOTAL, DEFENSE PROGRAMS STOCKPILE STEWARDSHIP				\$	547,373	\$	119,905	\$	109,263

FOOTNOTES

- 1/ Previously included as a subproject within 88-D-106, NWRD&T Facilities Revitalization, Phase II.
2/ Includes \$180,000 internally reprogrammed from Core Stockpile Stewardship operating expense.
3/ Includes \$1,000,000 internally reprogrammed from 88-D-105, Special Nuclear Material Laboratory Replacement.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Stewardship

1.	Title and Location of Project: Dual-Axis Radiographic Hydrodynamic Facility (DARHT) Los Alamos National Laboratory, Los Alamos, New Mexico	2a. Project No. 97-D-102 2b. Construction Funded
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SIGNIFICANT CHANGES

- The project scope has been redefined to include Phase 2 of this project -- completion of the second axis, and construction of the containment cleanout facility. As a result, the TEC has been increased by \$81,000,000, and the TPC has been increased by \$84,450,000, to new totals of \$186,700,000 and \$199,210,000 respectively.
- This TEC increase of \$81,000,000 is an estimate based on the Environmental Impact Statement (EIS) and the Record of Decision (ROD) issued for this project, and assumes that the second axis accelerator will be the same as the first axis accelerator. A Technology Options Study to select the best technology for the second arm, along with the cost, is in progress and should be complete prior to the FY 1999 Congressional Budget Submission.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Stewardship

1. Title and Location of Project: Dual-Axis Radiographic Hydrodynamic Facility (DARHT)
Los Alamos National Laboratory, Los Alamos, New Mexico

2a. Project No. 97-D-102
2b. Construction Funded

3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 3rd Qtr. FY 1988

3b. A-E Work (Titles I & II) Duration: 36 months

5. Previous Cost Estimate:
Total Estimated Cost (TEC) -- \$105,700
Total Project Cost (TPC) -- \$114,760

4a. Date Physical Construction Starts: 3rd Qtr. FY 1989

4b. Date Construction Ends: 1st Qtr. FY 1999 b/

6. Current Cost Estimate:
TEC -- \$186,700 1/2/3/
TPC -- \$199,210

7. Financial Schedule (Federal Funds): a/

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 1,800	\$ 0	\$ 1,800	\$ 201
1989	9,700	0	9,700	2,912
1990	15,760	(4,855) <u>4/</u>	10,905	10,767
1991	16,800	(11,800) <u>5/</u>	5,000	7,558
1992	0	0	0	5,139
1993	0	3,500 <u>6/</u>	3,500	2,643

1/ Funds appropriated in 1988-1996 are from the DARHT subproject 88-D-106 and are being moved to 97-D-102 to support management and monitoring of the project.

2/ The TEC includes \$81,000,000 as a planning estimate for Phase 2, and assumes a second axis accelerator will be the same as the first axis. Construction end date reflects only Phase 1 work. The detailed Phase 2 cost estimate and schedule will be developed as part of the Phase 2 CDR study.

3/ FY 1998 funding represents completion of Phase 1 (first axis) (\$24,300,000) and engineering planning and long-lead procurement for Phase 2 (\$22,000,000).

4/ Reflects the sequestration of funds for FY 1990 and the FY 1990 Omnibus reprogramming approved by appropriation subcommittees.

5/ Reflects the FY 1991 Omnibus reprogramming approved by Congressional subcommittees.

6/ \$3,500,000 redirected from prior year appropriation from Dormitories subproject of line item 88-D-106 at the Nevada Test Site (NTS).

1. Title and Location of Project:				Dual-Axis Radiographic Hydrodynamic Facility (DARHT)2a. Project No. 97-D-102	
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)				2b. Construction Funded	
1994	17,000	0	17,000	5,881	
1995	17,000	0	3,000	6,159	
1996	16,495	0	19,495	5,842	
1997	0	0	11,000	30,207	
1998	46,300 <u>b/c/</u>	0	46,300	45,645	
1999	59,000 <u>b/c/</u>	0	26,000	30,616	
2000	0	0	20,000	20,070	
2001	0	0	13,000	13,060	

1. Title and Location of Project:	Dual-Axis Radiographic Hydrodynamic Facility (DARHT)2a. Project No. 97-D-102
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)	2b. Construction Funded

8. Project Description, Justification, and Scope

- * The Dual-Axis Radiographic Hydrotest Facility (DARHT) project was previously a subproject of the Nuclear Weapons Research, Development, and Testing Facilities Revitalization, Phase II project (88-D-106). With the virtual completion of the remaining ten subprojects in 88-D-106, the DARHT effort was established as a stand-alone project in FY 1997 so that it can be more readily managed, monitored and funded.
- * The Financial Schedule includes the federal funds required for the first phase of the project and planning estimates for the second phase, to implement the Department's ROD released in October 1995 at the conclusion of the facility's Environmental Impact Study process. (Description of project phases begins on following page).
- * This data sheet details DARHT project requirements for FY 1998. Some of the DARHT requirements result from the fifteen month delay in the DARHT construction caused by a January 26, 1995 Federal Court injunction. Following a project-specific EIS/ROD released in October 1995 and subsequent judicial review, the January 1995 injunction was lifted on April 16, 1996. Construction work on the DARHT was resumed in May 1996, using previously appropriated funds. However, to move the project forward, FY 1998 funding will be required as outlined below.

Project History Leading to Current Project Scope

Originally, the project included two 16-MeV electron-beam accelerators producing x-rays. In FY 1990, the Department decided to defer construction of the Hydrotest Firing Site pending completion of technology development verified by the test results from an Integrated Test Stand. The Integrated Test Stand (ITS) consists of about 30 percent of one x-ray machine per the current LANL design (no funds were requested in FY 1992 and FY 1993). Following the successful ITS test results, development and construction of the hydrotest firing site was re-scoped based on the recommendations of two independent "Blue Ribbon" review committees assembled to assist the Department of Energy (DOE) in enhancing the development of a vital hydrotest capability. The new scope provided for the development, procurement, and installation of the first of two 16-MeV flash x-ray machines (for dual-axis radiography) at the firing site; and construction of a weatherproof building to house the dual-axis radiographic systems and supporting calibration activities. Construction was resumed in FY 1994.

- * On January 26, 1995, an injunction was issued for this project by the United States District Court for the District of New Mexico, requiring a cessation of all actions associated with the DARHT construction project, including any construction, procurement, design, or any furtherance of the DARHT project pending completion and judicial review of an EIS and ROD. In response, the Department ceased all project activities and completed an EIS for the project. A ROD was published in October 1995. The preferred option that was selected is to complete the project and operate the DARHT facility with the use of steel containment vessels. This containment option includes multiple phases to eventually obtain at least 75 percent reduction in the emissions from high-explosives testing when compared to the DARHT Baseline Alternative analyzed in the EIS. The January 1995 injunction was lifted in April 1996 and DARHT construction resumed in May 1996.
- * The DARHT project is now redefined to comply with the ROD preferred alternative and is divided into three phases. The first phase, most of which has been in progress since FY 1988, consists of the construction of a Radiographic Support Laboratory (RSL) and a Hydrotest Firing Site (HFS), which includes the first of two

1. Title and Location of Project:	Dual-Axis Radiographic Hydrodynamic Facility (DARHT)2a. Project No. 97-D-102
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)	2b. Construction Funded

- * flash x-ray machines. In addition, this phase includes: the initial stage of containment of emissions from the high-explosives experiments to be conducted at the
- * facility; an increase in accelerator energy from 16 to 20 MeV; changes in the accelerator to generate higher electron-beam currents; and improved diagnostics. The second phase will include the second flash x-ray machine, as well as the second stage of increased containment of testing emissions. The third phase consists of the third and final stage of increased containment of testing emissions. Each of the three phases of the DARHT project are described in greater detail below.

1. Title and Location of Project:	Dual-Axis Radiographic Hydrodynamic Facility (DARHT)2a. Project No. 97-D-102
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)	2b. Construction Funded

8. Project Description, Justification, and Scope (Continued)

Phase 1

Phase 1 provides for the construction of the Radiographic Support Laboratory, which is completed; development, procurement, and installation of the first of two flash x-ray machines (for dual-axis radiography) at the firing site; procurement and installation of state-of-the-art hydrodiagnostic instrumentation at the firing site; construction of a blastproof building to house the dual-axis radiographic systems and supporting calibration activities; and, the first containment vessel.

Hydrotest Firing Site

The complete Hydrotest Firing Site building will be constructed as part of this phase, as will the first x-ray machine and all electronic and optical diagnostics. The second machine, necessary to complete the essential dual-axis configuration of the facility, will be built in a sequential manner (Phase 2), allowing it to take advantage of engineering and scientific advances that may occur before its construction. The first machine will be a state-of-the-art linear induction accelerator, producing an electron beam of approximately 20-MeV that will be converted into an x-ray beam. In addition to the increase in beam energy from 16 MeV to 20 MeV, the use of a photocathode and higher current beam magnets will be added to significantly improve the radiographic performance. A high speed electronic data acquisition system, a firing site control system, and optical imaging systems will also be included. Optical instrumentation will include high-speed framing and streak cameras and laser velocity interferometers. To improve the diagnostics capability of this facility, a gamma-ray camera will be included.

A two-level, 38,200-square-foot building to house and operate both accelerators will be constructed. The walls and roof will be designed to shield personnel operating the facility from the radiation produced by the accelerators, as well as to resist blast forces resulting from the detonation of explosives. The accelerators will be located on a three foot thick concrete slab on grade. Each accelerator room will contain approximately 11,875 square feet and will be equipped with a 10-ton capacity bridge crane. Completion of the complete building for both x-ray machines allows installation of the second machine (Phase 2) to take place without stopping hydrodynamic testing activities that would begin upon installation of the first machine.

The power supply rooms will provide space adjacent to the accelerators for electrical equipment that serves the accelerators. These rooms will be equipped with 3-ton capacity bridge cranes. The detection chamber will be electromagnetically shielded. Adjacent to the detection chamber will be the control room, a cable room, a capacitor discharge unit (CDU) room, and a computer room. The detection chamber, computer room and accelerator control room will also be provided with an access flooring system. Other rooms will include an optical room, an analyzer room, a Fabry Perot room, a laser illumination room, an assembly room, toilets, and mechanical/electrical equipment room. This area will contain approximately 26,325 square feet.

Fire protection will be provided throughout by a hydraulically designed foam/water automatic sprinkler system. Plumbing and process piping will include hot and chilled circulating water, potable hot and cold water, industrial cool water, sanitary sewer, compressed air, natural gas, transformer oil, and low-conductivity water systems. A boiler and two chillers will be included to provide hot and cold water. This conditioned water will be used for heating, ventilating, and air-conditioning the building, with the exception of the detection chamber and accelerator control room, which will be serviced with

1. Title and Location of Project:

Dual-Axis Radiographic Hydrodynamic
Facility (DARHT) 2a. Project No. 97-D-
102

Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)

2b. Construction Funded

"computer-type" units. Two above-ground, 12,000 gallon oil storage tanks, a cooling tower, and an electrical substation will be required. Power will be supplied to the building from an existing 13.2 Kv line. The building will be equipped with communication systems that will include telephone, intercom, and broad band communications.

Site work will include a new asphalt surfaced access road, an asphalt surfaced circulation road and parking area, surface drainage, and erosion control. Utilities to be extended to the site will include natural gas, water, electrical power, and communication services. A septic tank and seepage pit will be provided to handle the sanitary sewage. Standard equipment will include office furnishings and work benches and storage shelving.

1. Title and Location of Project:	Dual-Axis Radiographic Hydrodynamic Facility (DARHT)2a. Project No. 97-D-102
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)	2b. Construction Funded

8. Project Description, Justification, and Scope (Continued)

For Phase 1 a prototype vessel system and a portable cleanout unit will be fabricated to obtain the initial 5 percent reduction in testing emissions when compared to the DARHT Baseline Alternative analyzed in the EIS for the first five-year period of facility operation. The prototype vessel system includes several large, steel vessels that would be assembled to realize a containment structure inside of which some of the high-explosives experiments would be conducted. Also included is the necessary equipment to handle and transport the vessel system.

Phase 2

Included in DARHT Phase 2 will be the second electron beam accelerator to be installed in the second accelerator hall provided in Phase 1. The second machine, necessary to complete the essential dual-axis configuration of the facility, will be built in a sequential manner, allowing it to take advantage of engineering and scientific advances that may occur before its construction. The planning estimates included are based on the second accelerator being the same as the first phase accelerator. This is necessary to meet the schedule commitments of the EIS and resulting ROD. The second machine may be a more advanced accelerator or incorporate another advanced technology that offers significant cost, schedule, or performance advantages. A CDR study is underway to more fully define the technology for the second accelerator. This study will be completed prior to submission of the FY 1999 funding request. Completion of the high-explosives containment strategy for 75 percent reduction would also be provided as part of this phase.

Based on the experience gained during Phase 1 containment efforts, a permanent vessel cleanout facility, of approximately 10,000 square feet, will be constructed and put into operation. The facility will contain one process line and two cleanout bays. The design will allow future expansion to two process lines and four cleanout bays. Five vessels and additional vessel segments will be fabricated as justified by operational experience. A reduction in testing emissions of at least 40 percent when compared to the DARHT Baseline Alternative analyzed in the EIS would be realized during the second five-year period of facility operation. Containment goals would be met or exceeded through the use of a combination of techniques: containment, material replacement, post-shot recovery, and program management.

Phase 3

Experience gained during Phase 1 and 2 will allow the final containment techniques to be implemented that would result in at least 75 percent reduction in testing emissions when compared to the DARHT Baseline Alternative analyzed in the EIS for the remaining years of facility operation. The Department of Energy (DOE) will meet the release reduction goals of this phase through the use of the combination of techniques discussed above. The decision to possibly further reduce testing emissions by developing a vessel system capable of containing a 440-lb (200-kg) charge will be made during this phase. No additional funding would be required for Phase 3 unless a decision to develop the 440-lb (200-kg) vessel is made.

Since its inception in 1988, the DARHT project has been recognized as a key link in DOE efforts to maintain the quality and reliability of the nuclear weapons stockpile. Historically, radiographic hydrodynamic tests and dynamic experiments have been a requirement to support the DOE (and predecessor agencies) mission; they remain an important requirement for future efforts of the Stockpile Stewardship and Management (SS&M) Program as they assist in the understanding and

1. Title and Location of Project:	Dual-Axis Radiographic Hydrodynamic Facility (DARHT)2a. Project No. 97-D-102
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)	2b. Construction Funded

evaluation of nuclear weapon performance. Dynamic experiments are used to gain information on the physical properties and dynamic behavior of materials used in nuclear weapons, including changes due to aging. Hydrodynamic tests are used to obtain diagnostic information on the behavior of a nuclear weapons primary (using simulated materials for the fissile materials in an actual weapon) and to evaluate the effects of aging on the nuclear weapons remaining in the greatly reduced stockpile. The information that comes from these types of tests and experiments cannot be obtained in any other way.

The DOE existing capability to obtain diagnostic information was designed and implemented at a time when the organization could rely on direct observations of the results of underground nuclear tests to provide definitive answers to questions regarding nuclear weapons performance. Without the ability to verify weapons performance through nuclear tests, the remaining diagnostic tools are inadequate by themselves to provide sufficient information. Accordingly, as the Nation moves away from nuclear testing, DOE must enhance its capability to use other tools to predict

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1. Title and Location of Project:	Dual-Axis Radiographic Hydrodynamic Facility (DARHT)2a. Project No. 97-D-102
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)	2b. Construction Funded

8. Project Description, Justification, and Scope (Continued)

weapons safety, performance, and reliability. In particular, DOE must enhance its capability to perform hydrodynamic experiments to assess the condition and behavior of nuclear weapons primaries.

Although the current U.S. stockpile is considered to be safe and reliable, the existing weapons are aging beyond their initial design lifetimes and, by the turn of the century, the average age of the stockpile will be older than at any time in the past. To ensure continued confidence in the safety and reliability of the U.S. nuclear weapons stockpile, DOE needs to improve its radiographic hydrodynamic testing capability as soon as possible. Uncertainty in the behavior of the aging weapons in the enduring stockpile will continue to increase with the passage of time because existing testing techniques, by themselves, are not adequate to assess the safety, performance, and reliability of the weapons primaries. Should DOE need to repair or replace any age-affected components, retrofit existing weapons, or apply new technologies to existing weapons, existing techniques are not adequate to assure weapons safety and reliability. In an era without nuclear testing, DOE believes that it is probable that the existing weapons will require these types of repairs or retrofits in the foreseeable future. DOE has determined that no other currently available advanced techniques exist that could provide a level of information regarding nuclear weapons primaries comparable to that which could be obtained from enhanced radiographic hydrodynamic testing.

In addition to weapons work, DOE uses its radiographic testing facilities to support many other science missions, and needs to maintain or improve its radiographic testing capability for this purpose. Hydrodynamic tests and dynamic experiments are important tools for evaluating conventional munitions; for studying hydrodynamics, materials physics, and high-speed impact phenomena, and for assessing and developing techniques for disabling weapons produced by outside interests.

- * Without providing "facilities" such as the DARHT hydrotest firing site, the U.S. risks losing its superiority in nuclear weapons technologies and safety. Lack of
- * adequate funding for FY 1998 will prevent the project from completion within the limits defined in the ROD. The dual-axis capability, the full mission of DARHT,
- * will be delayed. Furthermore, the hydrotesting program could be delayed if the full vessel systems and cleanout systems are not in place to meet the prescribed
- * emission containment requirements identified in the ROD.

1. Title and Location of Project:	Dual-Axis Radiographic Hydrodynamic Facility (DARHT)2a. Project No. 97-D-102
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)	2b. Construction Funded

9. <u>Details of Cost Estimate</u>	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 33,886
(1) Engineering design and inspection at approximately 19.5 percent of construction costs, (Design, Drawings, and Specifications)	\$ 26,973	
(2) Construction management costs	0	
(3) Project management at 5.0 percent of construction costs (Item c).	6,913	
b. Land and land rights		0
c. Construction costs		137,993
1. Improvements to land	0	
2. Buildings	22,615	
3. Special equipment	115,378	
4. Utilities	0	
5. Demolition	0	
d. Standard equipment		113
e. Major computer items		0
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout and acceptance <u>7/</u>		<u>0</u>
h. Subtotal (a through g)		\$171,992
i. Contingencies at approximately 8.6 percent of above costs		<u>14,708</u>
j. Total line item cost (Section 11.a.1.(a))		\$186,700
k. LESS: Non-Federal contribution		<u>0</u>
l. Net Federal total estimated cost (TEC)		<u>\$186,700</u>

10. Method of Performance

Design and procurement of the conventional facilities will be performed under negotiated architect-engineer contracts. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bidding.

7/ Included with ED&I (a(1)).

1. Title and Location of Project:	Dual-Axis Radiographic Hydrodynamic Facility (DARHT)2a. Project No. 97-D-102
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)	2b. Construction Funded

11. Schedule of Project Funding and Other Related Funding Requirements

a. Total project costs						
1. Total facility costs						
(a) Line item (Section 9.j.)	\$ 47,102	\$30,207	\$45,645	\$30,616	\$33,130	\$186,700
(b) Plant, Engineering and Design (PE&D)	0	0	0	0	0	0
(c) Operating expense funded equipment	1,1500	0	0	0	0	1,105
(d) Inventories	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
(e) Total facility cost (Federal and Non-Federal)	\$ 48,207	\$ 30,207	\$ 45,645	\$30,616	\$33,130	\$187,805
2. Other project costs						
(a) R&D necessary to complete project	\$ 1,110	\$ 1,300	\$ 1,275	0	0	\$ 3,685
(b) Conceptual design costs	450	2,000	0	0	0	2,450
(c) Decontamination and Decommissioning (D&D)	0	0	0	0	0	0
(d) NEPA documentation costs	2,960	0	0	0	0	2,960
(e) Other project related costs	<u>50</u>	<u>450</u>	<u>0</u>	<u>1,110</u>	<u>700</u>	<u>11,405</u>
(f) Total other project costs	<u>4,570</u>	<u>3,750</u>	<u>1,275</u>	<u>1,110</u>	<u>700</u>	<u>11,405</u>
(g) Total project costs	52,777	33,957	46,920	31,726	33,830	199,210
0	0	0	0	0	0	
(h) LESS: Non-Federal contribution						
(i) Net Federal total project costs	<u>52,777</u>	<u>33,957</u>	<u>46,920</u>	<u>31,726</u>	<u>33,830</u>	<u>199,210</u>
b. Related annual costs (estimated life of project--30 years)						
1. Facility operating costs						TBD
2. Facility maintenance and repair costs						TBD
3. Programmatic operating expenses directly related to the facility						TBD
4. Capital equipment not related to construction but related to the programmatic effort in the facility						TBD
5. GPP or other construction related to the programmatic effort in the facility						TBD
6. Utility costs						TBD
7. Other costs						<u>TBD</u>
Total related annual costs.....						\$ <u>TBD</u>

1. Title and Location of Project:	Dual-Axis Radiographic Hydrodynamic Facility (DARHT)2a. Project No. 97-D-102
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)	2b. Construction Funded

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project funding

1. Total facility costs

- (a) Line item -- Construction line item costs for the engineering design, procurement, demolition, and construction are estimated to be \$186,700,000 for Phases 1 and 2.
- (b) PE&D -- None.
- (c) Operating expense funded equipment -- This equipment is necessary to conduct the research and development (R&D).
- (d) Inventories -- None.

2. Other project costs

- (a) R&D necessary to complete construction -- Funded R&D costs are necessary to complete the equipment and vessel design.
- (b) Conceptual design -- Approximately \$2,450,000 will be incurred to establish the specific design and construction features for Phases 1 and 2.
- (c) Decontamination and Decommissioning (R&D) -- There are no D&D costs associated with this project.
- (d) NEPA documentation costs -- These are the costs of the DOE contractors, including Los Alamos National Laboratory, to support or prepare the EIS.
- (e) Other project related funding -- This is the cost for (1) facility start-up including the Readiness Assessment, (2) management of operating expense items.

b. Total related funding requirements

- 1. Facility operating costs -- The associated overhead for facility operating costs are to be determined.
- 2. Facility maintenance and repair costs -- The annual costs for direct labor, materials and supplies, and associated overhead for maintenance and repair activity are to be determined.
- 3. Programmatic operating expenses directly related to the facility -- These costs are to be determined.
- 4. Capital equipment not related to construction but related to the programmatic effort of the facility -- None.
- 5. GPP or other construction related to the programmatic effort -- None.
- 6. Utility costs -- These costs are to be determined.
- 7. Other Costs -- None.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Stewardship
Inertial Confinement Fusion

1. Title and location of project:	National Ignition Facility (NIF) Lawrence Livermore National Laboratory (LLNL), Livermore, CA	2a. Project No.: 96-D-111 2b. Construction Funded
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SIGNIFICANT CHANGES

- Engineering design work (i.e., Title I) since completion of the Conceptual Design Report in FY 1994, as well as advances in inertial confinement fusion science and technology, have led to some modifications in the design of the NIF. The Title I design has taken these into consideration, as well as the design of an optics assembly and refurbishment capability that was previously considered an infrastructure requirement. The costs for the design efforts associated with these changes have been absorbed within the amount of funding provided in the FY 1996 appropriation.
- On December 19, 1996, LLNL was selected as the site for the NIF as a part of the Record of Decision for the Stockpile Stewardship and Management Programmatic Environmental Impact Statement. The results of site selection and completion of Title I are incorporated in the total project costs (TPC) included in this revised data sheet. In addition, the site infrastructure costs which were footnoted in previous data sheets are now included in the TPC.
- The total estimated cost (TEC) has increased by \$203,100,000 from \$842,600,000 to \$1,045,700,000 due to the following:
 - design evolution and other changes identified in the process of completing Title I engineering design (\$29.7 million)
 - the incorporation of the following additional functionality required to optimize the facility and increase its flexibility and to meet the needs of the Stockpile Stewardship and Management program:
 - optics assembly capability, which was previously footnoted as an infrastructure requirement (\$28.7 million)
 - beam smoothing (\$5.5 million)
 - addition of flashlamp cooling (\$9.8 million)
 - change to 4x2 amplifiers (\$48.3 million)
 - capability to implement direct drive in the future (\$11 million)
 - not to preclude radiation testing (\$6.9 million)
 - reduced spot size for weapons physics (\$13.2 million)
 - delay in project completion by one year (\$50 million)

1. Title and Location of Project:	National Ignition Facility (NIF)
2a. Project No. 96-D-111	
Site To Be Determined (Continued)	2b.
Construction Funded	

- The TPC has increased by \$125,300,000 from \$1,073,600,000 to \$1,198,900,000 due to the TEC increases described above and offset partially by a reduction in Other Project Costs (OPC) of \$77,800,000. This is the result of the selection of a specific site which has enabled detailed planning of transitioning the project to program operations. Selection of LLNL as the site takes advantage of its ICF infrastructure and experience, including existing facilities, trained staff, support facilities and equipment; and allows initial operations of a portion of the NIF to be accelerated by two years.

1. Title and Location of Project:		National Ignition Facility (NIF)
2a.	Project No. 96-D-111	
	Site To Be Determined (Continued)	2b.
Construction Funded		

SIGNIFICANT CHANGES (continued)

- The NIF will be constructed in a manner that makes the first bundle of eight lasers available for experimental capabilities in support of Stockpile Stewardship two years before project completion. In addition to providing valuable data for the Stockpile Stewardship program two years earlier, this approach also: reduces overall project risk due to the early demonstration of key facility systems; maximizes the cost effectiveness of the project; integrates experienced experimental program staff at an earlier stage in the project; and, utilizes existing trained Nova operators.
- The completion date of 3rd quarter FY 2002 has changed to 3rd quarter FY 2003. The one-year slip in schedule (and associated total estimated cost increase of \$50,000,000) is the tradeoff for a project funding profile that is consistent with estimated outlays for Defense Programs in FY 1998 and the outyears.

DEPARTMENT OF ENERGY
 FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
 (Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

WEAPONS ACTIVITIES
 (Tabular dollars in thousands. Narrative material in whole dollars.)

Weapons Stockpile Stewardship
 Inertial Confinement Fusion

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- | | |
|--|---|
| 1. Title and Location of Project: National Ignition Facility (NIF)
Lawrence Livermore National Laboratory (LLNL), Livermore, CA | 2a. Project No. 96-D-111
2b. Construction Funded |
|--|---|
-
- | | |
|---|---|
| 3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 1st Qtr. FY 1996

3b. A-E Work (Titles I & II) Duration: 24 months | 5. Previous Cost Estimate:
Total Estimated Cost (TEC) -- \$ 842,600
Total Project Cost (TPC) -- \$1,073,600 |
|---|---|
-
- | | |
|---|---|
| 4a. Date Physical Construction Starts: 3rd Qtr. FY 1997

4b. Date Construction Ends: 3rd Qtr. FY 2003 | 6. Current Cost Estimate:
TEC-- \$1,045,700
TPC-- \$1,198,900 |
|---|---|

7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriation a/</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
Previous	\$ 0	\$ 0	\$ 0	\$ 0
1996	37,400	0	37,400	33,990
1997	131,900	0	131,900	91,010
1998	876,400	0	197,800	147,200
1999	0	0	284,200	246,900
2000	0	0	248,100	192,600
2001	0	0	74,100	155,800
2002	0	0	49,000	128,600
2003	0	0	23,200	49,600

a/ Funding requirements (BA) represent total estimated cost (TEC) of the project only. Activities included under other project costs (OPC) are explained in Item 12.a.2. and the corresponding operations and maintenance funding identified in Item 11.a.2. are essential to achieving the project scope and schedule.

1. Title and Location of Project:National Ignition Facility (NIF) Lawrence Livermore National Laboratory (LLNL), Livermore, CA	2a.Project No. 96-D-111 2b.Construction Funded
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8. Project Description, Justification and Scope

- * The Project provides for the design, procurement, construction, assembly, installation, and acceptance testing of the National Ignition Facility (NIF), an experimental inertial confinement fusion facility intended to achieve controlled thermonuclear fusion in the laboratory by imploding a small capsule containing a mixture of the hydrogen isotopes, deuterium and tritium. If a decision is made to proceed with construction, the NIF will be constructed at the Lawrence Livermore National Laboratory (LLNL), Livermore, California as determined by the Record of Decision made on December 19, 1996, as a part of the Stockpile Stewardship and Management Programmatic Environmental Impact Statement (SSM PEIS).

- * The mission of the National Inertial Confinement Fusion (ICF) program is to achieve controlled thermonuclear fusion in the laboratory. This program supports the DOE mandate of maintaining nuclear weapons science expertise required for stewardship of the stockpile, testing of nuclear weapons effects, and the development of fusion power by providing a database for inertial fusion ignition. As a key element of the Stockpile Stewardship Program, the NIF is designed to achieve propagating fusion burn and modest (1-10) energy gain within 2-3 years of initial operation and to conduct high energy density experiments, both through fusion ignitions and through direct application of the high laser power. This mission was identified in the NIF Justification of Mission Need, which was endorsed by the Secretary of Energy. Identification of target ignition as the next important step in ICF development for both defense and non-defense applications is consistent with the earlier (1990) recommendation of DOE's Fusion Policy Advisory Committee, and the National Academy of Sciences Inertial Fusion Review Group. In 1995, the DOE's Inertial Confinement Fusion Advisory Committee affirmed the program's readiness for an ignition experiment. A review by the JASONs in 1996 affirmed the value of the NIF for stockpile stewardship.

- * The NIF project supports the DOE mandate to maintain nuclear weapons science expertise required for stewardship of the stockpile. After the United States announcement of a moratorium on underground nuclear tests in 1992, the Department established the Stockpile Stewardship program to ensure the preservation of the core intellectual and technical competencies in nuclear weapons. In addition, as a means of reducing the danger posed by nuclear weapons proliferation, the President announced that the United States would seek a zero yield Comprehensive Test Ban Treaty (CTBT). The treaty was signed on September 24, 1996. One of the six safeguards that defines the terms of the CTBT is the conduct of the Stockpile Stewardship program to ensure the safety and reliability of the stockpile. The NIF is one of the most vital facilities in that program. The NIF will provide the capability to conduct laboratory experiments to address the high energy density and fusion aspects that are so important to both primaries and secondaries in stockpile weapons.

At present, the Nation's computational capabilities and scientific knowledge are inadequate to ascertain all of the performance and safety impacts from changes in the nuclear warhead physics packages due to aging, remanufacturing, or engineering and design alterations. Such changes are inevitable if the warheads in the stockpile are retained well into the next century, as expected. In the past, the impacts of such changes were evaluated through nuclear weapon tests. Without underground tests, we will require better, more accurate computational capabilities to assure the reliability and safety of the nuclear weapons stockpile for the indefinite future.

To achieve the required level of confidence in our predictive capability, it is essential that we have access to near-weapons conditions in laboratory experiments. The importance of nuclear weapons to our national security requires such confidence. For detonation of weapon primaries, that access is provided in part by hydrodynamic testing. For secondaries and for some aspects of primary performance, the NIF will be a principal laboratory experimental physics facility.

1. Title and Location of Project:National Ignition Facility (NIF) Lawrence Livermore National Laboratory (LLNL), Livermore, CA	2a.Project No. 96-D-111 2b.Construction Funded
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The most significant potential commercial application of ICF in the long term is the generation of electric power. Consistent with the recommendations of the Fusion Policy Advisory Committee, the NIF will provide a unique capability to address critical elements of the inertial fusion energy program by exploring moderate gain (1 to 10) target designs, establishing requirements for driver energy and target illumination for high gain targets, and developing materials and technologies useful for civilian inertial fusion power reactors.

The ignition of an inertial fusion capsule in the laboratory will produce extremely high temperatures and densities in matter. Thus, the NIF will also become a unique and valuable laboratory for experiments relevant to a number of areas of basic science and technology.

1. Title and Location of Project:National Ignition Facility (NIF) Lawrence Livermore National Laboratory (LLNL), Livermore, CA	2a.Project No. 96-D-111 2b.Construction Funded
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8. Project Description, Justification and Scope (continued)

The NIF is an experimental fusion facility consisting of a laser and target area, and associated assembly and refurbishment capability. The laser will be capable of providing an output pulse with an energy of 1.8 megajoules (MJ) and an output pulse power of 500 terawatts (TW) at a wavelength of 0.35 micrometers (μm) and with specified symmetry, beam balance and pulse shape. The NIF design calls for an experimental facility to house a multibeam line, neodymium (Nd) glass laser capable of generating and delivering the pulses to a target chamber. In the target chamber, a positioner would center a target containing fusion fuel, a deuterium-tritium mixture, for each experiment. Diagnostics provided by this project would provide the test data to demonstrate subsystem performance and initial operations.

* The NIF experimental facility, titled the Laser and Target Area Building, would provide an optically stable and clean environment. This laser building would
* be shielded for radiation confinement around the target chamber and will be designed as a radiological, low -hazard facility capable of withstanding the natural phenomena specified for the LLNL site. The baseline facility is for one target chamber, but the design shall not preclude future upgrade for additional target chambers.

The NIF project consists of conventional and special facilities.

- * ● Site and Conventional Facilities include the land improvements (e.g., grading, roads) and utilities (electricity, heating gas, water), as well as the laser
* building, which has an approximately 19,000 square meters footprint and 38,000 square meters in total area. It is a reinforced concrete and structural steel building that provides the vibration-free, shielded, and clean space for the installation of the laser, target area, and integrated control system. The
* laser building consists of two laser bays, each 31 meters (m) by 135 m long, and a central target area--a heavily shielded (1.8 m thick concrete) cylinder
* 32 m in diameter and 32 m high. The laser building includes security systems, radioactive confinement and shielding, control rooms, supporting utilities,
* fire protection, monitoring, and decontamination and waste handling areas. Optics assembly and refurbishment capability is provided for at LLNL by
* incorporation of an optics assembly area attached to the laser building and minor modifications of other existing site facilities.
- Special facilities include the Laser System, Target Area, Integrated Computer Control System, and Optics.
 - The laser system is designed to generate and deliver high power optical pulses to the target chamber. The system consists of 192 laser beamlets configured to illuminate the target surface with a specified symmetry, uniformity, and temporal pulse shape. The laser pulse originates in the pulse generation system. This precisely formatted low energy pulse is amplified in the main amplifier. To minimize intensity fluctuation, each beam is passed through a pinhole in a spatial filter on each of the four passes through the amplifier and through a transport spatial filter. The beam transport directs each high power laser beam to an array of ports distributed around the target chamber where the frequency of the laser light is tripled to 0.35 μm , spatially modulated by phase plates and focused on the target. Systems are provided for automatic control of alignment and the measurement of the power and energy of the beam. Structural support and auxiliary systems provide the stable platform and utilities required.
 - The target area includes a 10 m diameter, low activation (i.e., activated from radiation) aluminum vacuum chamber located in the Target Area of the laser building. Within this chamber, the target will be precisely located. The chamber and building structure provide confinement of

1. Title and Location of Project:National Ignition Facility (NIF) Lawrence Livermore National Laboratory (LLNL), Livermore, CA	2a.Project No. 96-D-111 2b.Construction Funded
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radioactivity (e.g., x-rays, neutrons, tritium, and activation products). Diagnostics will be arranged around the chamber to demonstrate subsystem performance for project acceptance (TEC) and initial operations (TPC). Structural, utility and other support systems necessary for safe operation and maintenance will also be provided in the Target Area. The target chamber and staging areas will be capable of conducting experiments with cryogenic targets. The Experimental Plan indicates that cryogenic target experiments for ignition will be needed 2-3 years after completion of the project. Therefore, the targets and this cryogenic capability will be supplied by the experiments. The NIF project will make mechanical and electrical provisions necessary to position and align the cryogenic targets within the chamber. The baseline is for indirectly driven targets. An option for future modifications to permit directly driven targets is included in the design.

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1. Title and Location of Project:National Ignition Facility (NIF) Lawrence Livermore National Laboratory (LLNL), Livermore, CA	2a.Project No. 96-D-111 2b.Construction Funded
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8. Project Description, Justification and Scope (continued)

- The integrated computer control system includes the computer systems (note: no individual computer will cost over \$100,000) required to control the laser and target systems. The system will provide the hardware and software necessary to support NIF operations. Also included is an integrated timing system for experimental control of laser and diagnostic operations. Safety interlocks and access control will also be provided.

- * - Thousands of optical components will be required for the 192 beamlet NIF. These components include laser glass, lenses, mirrors, polarizers, deuterated potassium dihydrogen phosphate crystals, pulse generation optics, debris shields and windows, and the required optics coatings. Optics includes quality control equipment to receive, inspect, characterize, and refurbish the optical elements.

9. Details of Cost Estimate

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 220,100
1. Engineering, design and inspection at approximately 21.9 percent of construction costs (Item c)	\$ 152,000	
2. Construction management at approximately 3.1 percent of construction costs (Item c)	21,500	
3. Project management at approximately 6.7 percent of construction costs (Item c)	46,600	
b. Land and land rights		0
c. Construction costs		693,800
1. Improvements to land	1,800	
2. Buildings modification	175,800	
3. Site-specific infrastructure	0	
4. Other Structures	0	
5. Utilities	500	
6. Special Facilities	515,700	
d. Standard equipment		0
e. Major computer items		0
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout and acceptance		0
h. Subtotal (a through g)		\$ 913,900
i. Contingencies of approximately 15.1 percent of remaining costs		<u>131,800</u>
j. Total line item cost (Section 11.a.1.(a)		\$1,045,700 b/
k. LESS: Non-Federal contribution		<u>0</u>
l. Net Federal total estimated cost (TEC)		<u>\$1,045,700</u>

b/ Based on 100 percent Title I design completion .

1. Title and Location of Project:National Ignition Facility (NIF) Lawrence Livermore National Laboratory (LLNL), Livermore, CA	2a.Project No. 96-D-111 2b.Construction Funded
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The cost estimate assumes a project organization and cost distribution consistent with the management requirements appropriate for a DOE Strategic System as outlined in the DOE Order 430.1, Life Cycle Asset Management and the NIF Project Execution Plan. Actual cost distribution will be in conformance with accounting guidelines in place at the time of project execution.

10. Method of Performance

The NIF Laboratory Project Office (consisting of LLNL, LANL, SNL, and UR/LLE and supported by competitively-selected contracts with Architect Engineering firms, a Construction Manager, equipment and material vendors, and construction firms) will prepare the design, procure equipment and materials, and perform conventional construction, safety, system analysis, and acceptance tests. DOE will maintain oversight and coordination through the Headquarters Office of Inertial Fusion and the National Ignition Facility Project and the field office. DOE conducted the site selection and the NEPA determination. LLNL was selected as the construction site in the Record of Decision made on December 19, 1996. The procurement and installation/test of special equipment will be performed by the NIF Laboratory Project Office. Inspection and Title III engineering contracts for the conventional systems will be competitively awarded. NIF start-up will be conducted by the NIF laboratory operations staff.

1. Title and Location of Project: National Ignition Facility (NIF) Lawrence Livermore National Laboratory (LLNL), Livermore, CA	2a. Project No. 96-D-111 2b. Construction Funded
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11. Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1996	FY 1997	FY 1998	FY 1999	Outyears	Total
a. Total project costs							
1. Total facility costs							
(a) Line item (Section 9.j.)	\$ 0	\$ 33,990	\$ 91,010	\$ 147,200	\$ 246,900	\$ 526,600	\$1,045,700
(b) Plant, Engineering and Design (PE&D)	0	0	0	0	0	0	0
(c) Operating expense funded equipment	0	0	0	0	0	0	0
(d) Inventories	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total facility costs (Federal and Non-Federal)	\$ 0	\$ 33,990	\$ 91,010	\$ 147,200	\$ 246,900	\$ 526,600	\$1,045,700
2. Other project costs							
(a) R&D necessary to complete construction	\$ 0	\$ 8,200	\$ 36,900	\$ 50,600	\$ 6,500	\$ 0	\$ 102,200
(b) Conceptual design costs	\$ 12,000	300	0	0	0	0	12,300
(c) Decontamination and Decommissioning (D&D)	0	0	0	0	0	0	0
(d) NEPA documentation costs	800	2,600	500	600	100	500	5,100
(e) Other project related costs	<u>4,700</u>	<u>10,200</u>	<u>2,400</u>	<u>1,600</u>	<u>1,200</u>	<u>13,500</u>	<u>33,600</u>
(f) Total other project costs	<u>\$ 17,500</u>	<u>\$ 21,300</u>	<u>\$ 39,800</u>	<u>\$ 52,800</u>	<u>\$ 7,800</u>	<u>\$ 14,000</u>	<u>\$ 153,200</u>
(g) Total project cost	\$ 17,500	\$ 55,290	\$ 130,810	\$ 200,000	\$ 254,700	\$540,600	\$1,198,900
(h) LESS: Non-Federal contribution	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 0</u>	<u>\$ 0</u>
(i) Net Federal total project (TPC)	<u>\$ 17,500</u>	<u>\$ 55,290</u>	<u>\$ 130,810</u>	<u>\$ 200,000</u>	<u>\$ 254,700</u>	<u>\$540,600</u>	<u>\$1,198,900</u>

Note: Budget Authority (BA) requirements

TEC c/	\$... 0	\$ 37,400	\$ 131,900	\$ 876,400	\$ 0	\$ 0	\$1,045,700
OPC d/	<u>\$ 18,200</u>	<u>\$ 23,600</u>	<u>\$ 59,200</u>	<u>\$ 31,300</u>	<u>\$ 6,800</u>	<u>\$ 14,100</u>	<u>\$ 153,200</u>
Total	<u>\$ 18,200</u>	<u>\$ 61,000</u>	<u>\$ 191,100</u>	<u>\$ 907,700</u>	<u>\$ 6,800</u>	<u>\$ 14,100</u>	<u>\$1,198,900</u>

b. Related annual costs (estimated life of project--30 years)

1. Facility operating costs	\$ 23,400
2. Facility maintenance and repair costs	33,500

c/ Specific long-lead procurements and contracts (e.g., building construction; major laser, optics, and target area special equipment) require BA in advance of costs.

d/ Specific long-lead procurements and contracts (e.g., optics facilitization) require BA in advance of costs.

1. Title and Location of Project:National Ignition Facility (NIF) Lawrence Livermore National Laboratory (LLNL), Livermore, CA	2a.Project No. 96-D-111 2b.Construction Funded
3. Programmatic operating expenses directly related to the facility	58,000 <u>e/</u>
4. Capital equipment not related to construction, but related to the programmatic effort in the facility	200
5. GPP or other construction related to programmatic effort in the facility	200
6. Utility costs	2,400
7. Other costs	<u>4,200</u>
Total related annual funding (in FY 1998 dollars)	<u><u>\$121,900</u></u>

e/ This primary experimental operating expense will be included in the base Inertial Confinement Fusion Program budget.

1. Title and Location of Project: National Ignition Facility (NIF) Lawrence Livermore National Laboratory (LLNL), Livermore, CA	2a. Project No. 96-D-111 2b. Construction Funded
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12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project costs

1. Total facility costs

- (a) Line item -- Narrative not required.
- (b) PE&D -- None.
- (c) Operating expense funded equipment -- None.
- (d) Inventories -- None.

2. Other project costs

- (a) R&D necessary to complete construction -- Costs include optics vendor facilitization (\$76,800) and optics quality assurance (\$25,400).
- (b) Conceptual design and engineering studies -- Includes the original conceptual design report completed in FY 1994 (\$12,000) and the conceptual design activities for the optical assembly and refurbishment capability and site infrastructure (\$300).
- (c) Decontamination and decommissioning (D&D) -- None.
- (d) NEPA documentation -- Preparation includes the NIF portion of the Stockpile Stewardship and Management Programmatic Environmental Impact Statement (\$3,400) and environmental monitoring and permits (\$1,700).
- (e) Other project related costs -- Engineering studies (including advanced conceptual design) of project options (\$5,900); assurances, safety analysis, and integration (\$9,400); start-up planning, management, training, and staffing (\$5,600); procedure preparation (\$1,500); operating spares (\$600); start-up (\$8,600); and ORR (\$2,000).

b. Related annual costs

- 1. Facility operating costs -- Includes operator labor, engineering support and materials for upgrades and modifications, and consumables for operation of special equipment.
- 2. Facility maintenance and repair costs -- Includes cost of labor, engineering support, and consumables for special equipment maintenance and refurbishment, including optics. Also includes maintenance for the laser building and support buildings.
- 3. The current NOVA experimental program, including LLNL, LANL, SNL, and General Atomics, is approximately \$39,000 annually. Based on use of complex cryogenic targets, increased diagnostics support, and higher levels of three dimensional physics modeling, the annual direct NIF experimental program costs are estimated at \$58,000. Additional program costs will be associated with use of the facility.
- 4. Fabrication accounts, procurements, such as small lasers and some laser parts, Computer-Aided Design systems, etc. to support upgrades.
- 5. Minor additions and modifications to the facility related to programmatic effort.
- 6. Electricity only. Gas, sewer, water, etc. are paid out of the General and Administrative budget.
- 7. Nitrogen and argon for laser and transport beam tubes, stock inventory, and procurement support.

1. Title and Location of Project:National Ignition Facility (NIF) Lawrence Livermore National Laboratory (LLNL), Livermore, CA	2a.Project No. 96-D-111 2b.Construction Funded
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13. Design and Construction of Federal Facilities

The total estimated cost of this project includes, where appropriate, the cost of measures necessary to assure compliance with OMB Circular No. A-106, and Executive Order No. 12088, "Federal Compliance with Pollution Control Standards"; Section 19 of the Occupational Safety and Health Act of 1970, the provisions of Executive Order No. 12196, and the related Safety and Health provisions for Federal Employees (CFR Title 29, Chapter XVII, Part 1960); and the Architectural Barriers Act of 1968." The project will be located in an area not subject to flooding determined in accordance with Executive Order 11988.

14. Supplementary project data for facility utilization

The NIF will provide new space and capacity. Supplemental information on facility utilization will be provided after a site is selected.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Stewardship

1.Title and Location of Project:Contained Firing Facility Addition

Lawrence Livermore National Laboratory, Livermore, California

2a.Project No. 96-D-105

2b.Construction Funded

SIGNIFICANT CHANGES

- None.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Stewardship

1. Title and Location of Project: Contained Firing Facility Addition Lawrence Livermore National Laboratory, Livermore, California	2a. Project No. 96-D-105 2b. Construction Funded
3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 2nd Qtr. FY 1996 3b. A-E Work (Titles I & II) Duration: 14 months	5. Previous Cost Estimate: Total Estimated Cost (TEC) -- \$ 49,700 Total Project Cost (TPC) -- \$ 52,765
4a. Date Physical Construction Starts: 4th Qtr. FY 1997 4b. Date Construction Ends: 3rd Qtr. FY 1999	6. Current Cost Estimate: TEC -- \$ 49,700 TPC -- \$ 52,765
7. <u>Financial Schedule (Federal Funds):</u>	

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1996	\$ 6,600	\$ 0	\$ 6,600	\$ 2,550
1997	17,100	0	17,100	11,400
1998	26,000	0	19,300	23,400
1999	0	0	6,700	12,350

8. Project Description, Justification and Scope

The Contained Firing Facility Addition is a capability addition to the Flash X-Ray Facility at Lawrence Livermore's Site 300.

* This project is a facility of approximately 28,900 square feet (SF), consisting of four related structures, to increase the safety and environmental compliance of firing explosive charges up to a 60 kg limit of energetic high explosives. This project builds on to the existing Building 801 (B801) firing bunker at the existing firing table site adjacent to B801.

*

The four structures are a structurally reinforced Firing Chamber, a Support Facility, a Diagnostic Equipment Facility and an Office Module.

The Firing Chamber is designed to contain the effects of cased high explosive materials used in various laboratory experiments. The explosive quantities vary in operational weight up to approximately 60 kg, or an equivalent TNT design weight of approximately 206.3 pounds. The chamber must be protected from shrapnel from explosive casings. All major structural elements are to remain elastic to permit repetitive chamber usage with no structural damage.

1. Title and Location of Project: Contained Firing Facility Addition Lawrence Livermore National Laboratory, Livermore, California (Continued)	2a. Project No. 96-D-105 2b. Construction Funded
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8. Project Description, Justification and Scope (Continued)

The restraints imposed by the number and pattern of the existing camera ports, whose inclusion within the chamber is required, led to the selection of a chamber, of approximately 3,700 SF. In this configuration loads are resisted by structural elements acting primarily in tension-flexure combination. The interior surfaces of the chamber will have a steel liner on the walls and ceiling and the floor. In addition, the walls and ceiling will have layers of removable mild steel plate for shrapnel protection, and the floor will be covered by a steel plate anvil directly under the firing area. The Firing Chamber includes a blast effects door to permit vehicle entry, blast effects doors for personnel entry, and numerous smaller openings for air ducts, diagnostic ports, cable penetrations and TV camera, all protected against shrapnel and pressure damage.

- * At B801, the existing bullnose will be cut away and be rebuilt as part of the new Firing Chamber. The existing Camera Room at this location will be retained and the chamber floor will be configured in order to accommodate the present camera room roof.
- * The Support Facility of approximately 16,600 SF provides a staging area for experiment preparation, storage of equipment and materials to be used, and personnel areas for lockers, toilets and decontamination showers. A mezzanine above the personnel area is used for mechanical equipment with an additional mechanical equipment area adjacent to the staging area. The Support Facility is comprised of non-bearing tilt-up reinforced concrete panel walls supported structurally by a rigid steel frame system. The roof is metal deck and concrete with insulation and a single ply roofing system.
- * The Diagnostic Equipment Facility of approximately 6,200 SF is similar to the Support Facility and has non-bearing, tilt-up reinforced concrete panel walls supported structurally by a rigid steel frame system. The roof is a metal deck with concrete, insulation, and a single ply roofing system. The interior space will be open to accommodate a variety of diagnostic equipment. Adjacent to the perimeter wall will be a new stair going down to an extended corridor which will lead into the existing facility for complete interior access to all areas. The wall will have penetrations for a variety of diagnostics. Access to the Support Facility will be from the diagnostic area through the locker, shower, toilet complex. The diagnostic area will have both fluorescent and dimmable incandescent light fixtures, a wet pipe sprinkler system, and an HVAC system with 95% efficient final filters. The space will also have floor drains and low conductivity water piping. This facility will require extensive earthwork.
- * The Office Module of approximately 2,400 SF will consist of 7 offices for permanent staff and visiting experimenters, a conference room and open areas for file cabinets and partitioned desk space.
- * Access at B801 will be by means of new and existing roads. Drive areas around the Support Facility will be paved. A paved parking lot will be provided to replace parking stalls displaced by new facilities as well as to accommodate the increase in visitors and facility users. A net total of 21 parking spaces will be added. Non-hazardous sewage disposal for the proposed facilities will be by means of a new septic tank and leach field system at B801.
- * The Firing Chamber and Support Facility areas will have an air conditioning system consisting of air handling units with prefilters, final filters, energy recovery coil, direct expansion coil, electric resistance heaters, and a supply fan. The Firing Chamber purge system will consist of a supply fan and a pollution control system with cartridge dust collectors, prefilters, High Efficiency Particulate Air (HEPA) filters, wet scrubbers, and an exhaust fan.

1. Title and Location of Project: Contained Firing Facility Addition Lawrence Livermore National Laboratory, Livermore, California (Continued)	2a. Project No. 96-D-105 2b. Construction Funded
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8. Project Description, Justification and Scope (Continued)

Tasks associated with all buildings include the material handling system, instrumentation and control system, washwater control system, waste water filtration system, process utilities, and environmental compliance for airborne and waste water discharge from the facility. Material handling will be accomplished by providing a specially designed mobile crane with a capacity of 40 tons. Washwater control includes automatic and manual washdown for the Firing Chamber itself; while the other areas require only a manual washdown system. Process gases to be supplied to the facility include argon, methane, compressed air, vacuum, helium and nitrogen. Environmental control requires the monitoring of combustion gases and waste water. To obtain a complete material balance, a number of unique measuring devices will be provided.

The purpose of this project is to minimize hazardous emissions to the environment, reduce quantities of hazardous waste, and to provide a continuing capability to test the high explosive component of a nuclear weapon. These goals will be achieved through the design and use of a contained firing chamber and support structures at LLNL's existing firing site Bunker 801 at Site 300.

Lawrence Livermore National Laboratory maintains and operates open-air high explosive test facilities at Site 300 as part of their Stockpile Stewardship program. Many of the devices involved in these tests contain toxic and/or low level radioactive materials (depleted uranium). At present, the firing operations at these facilities are in compliance with all applicable environmental laws. However environmental standards are evolving at a rapid pace and it is expected that our open-air explosive testing will come under increased scrutiny as these regulations become more stringent.

This project will be the pacesetter in the area of explosive testing technology. The project will provide the capability to reduce to negligible levels the emissions of hazardous materials into the environment during and after explosive testing and will reduce the total amount of hazardous wastes generated. In addition it will provide a safer work environment, fully compatible with evolving plans for nearby commercial/residential development.

The testing areas at Site 300 offer combined diagnostic capabilities that exist nowhere else. Most test shots are one-of-a-kind, each being assembled under the day to day scrutiny of the weapons designer. Since most shots are of a development nature, it is important that they be transported a minimum distance from their assembly point to the test facility. Finally, because the intense level of interaction between the weapon designer, the shot diagnosticians and firing facility operators, these testing facilities must be located close to the design laboratory.

An essential ingredient of all nuclear weapons is the chemical high explosive component which provides the energy necessary to drive the fissile material to criticality, producing the initial fission yield. The shaping and timing of the detonation wave in the high explosive component is crucial to weapon performance. The sensitivity of the high explosive component to abnormal environments determines weapon safety. The testing facilities at Site 300 are dedicated to these necessary studies of weapon performance and safety.

* The Site 300 Contained Firing Facilities Addition requested herein is required for three reasons:

1. Environmental consideration
2. Operational and cost saving advantages
3. Flexibility in application of diagnostic technology

1. Title and Location of Project: Contained Firing Facility Addition	2a. Project No. 96-D-105
Lawrence Livermore National Laboratory, Livermore, California (Continued)	2b. Construction Funded

8. Project Description, Justification and Scope (Continued)

Environmental Requirements

Environmental regulations require that hazardous materials be accounted for and tracked from their point of generation to their disposal. This regulation may soon be applied to LLNL site 300 high explosives testing operations. A contained firing chamber provides an intrinsic solution to the issue of accountability since no uncontrolled transfer of these materials from the firing chamber to the environment will occur. This will be true for shrapnel and particulates resulting from the shot as well as the detonation gases themselves. This concept will also apply to water used to clean the inside of the chamber.

Site 300 has had no close-in residential neighbors since its creation in the early 1950's. However, it is now faced with encroachment of a major residential development along its north and northeast boundaries. Nearby residents may be impacted by blast noise. They may also perceive health risks from low level toxic/radioactive emissions. Controlling the release of blast pressure and potentially hazardous emissions will reduce the public's perception of risk as well as the potential for environment impact.

The quantities of hazardous waste produced from weapons shots will be minimized. Since gravel will not be necessary in the chamber, no contaminated firing table gravel will be produced. Tents and other coverings for experiments used in open air firing, resulting in additional wastes will also no longer be necessary.

Operational Advantages

* The time and cost of periodic firing table gravel changeout will be eliminated. Cleanup of shots will be more efficient, producing substantially less total hazardous wastes. Some muster zones and areas of safety control will no longer be necessary with contained firing. The actual firing time of any experiment now depends on weather conditions. When atmospheric inversions exist, blast effects could inadvertently be focused on surrounding communities (Tracy, Livermore). A contained firing chamber will eliminate this dependency and allow firing at any time, under any weather conditions. The cost of maintaining fire trails and performing extensive burnoff of surrounding hillsides to minimize fire hazards will be reduced. The vault-like nature of the structure will minimize the need for security protection or concerns should an unauthorized individual approach a firing area during a shot. This is a concern that will increase with encroaching residential development.

Flexibility in Diagnostic Technology

* The contained firing chamber concept is consistent with the development and application of advanced diagnostic techniques. Such new diagnostics are required in order that reliable new weapons may continue to be put into the arsenal, especially considering the current moratorium on nuclear testing and a Comprehensive Test Ban Treaty, which was signed by the President on September 24, 1996. Weapons safety testing is another area of increasing importance that will be supported by this facility. Advanced diagnostics include such items as time sequenced x-ray imaging of the detonation and multiple beam laser velocimetry. Careful design of the enclosed firing chamber will further enhance the potential for improved diagnostics by providing an environmentally conditioned space for the test assembly with close-in diagnostic access.

* The FY 1998 funds will be used for construction.

1. Title and Location of Project: Contained Firing Facility Addition	2a. Project No. 96-D-105
Lawrence Livermore National Laboratory, Livermore, California (Continued)	2b. Construction Funded

9. Details of Cost Estimate a/

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 13,360
(1) Engineering design and inspection at approximately 32.2 percent of construction costs (Item c)	\$ 8,210	
(2) Construction management at 7.8 percent of construction costs (Item C)	1,980	
(3) Project management at 12.4 percent of construction costs (Item C)	3,170	
b. Land and land rights		0
c. Construction costs		25,480
1. Improvements to land	760	
2. Buildings	21,050	
3. Other structures	0	
4. Utilities	780	
5. Special facilities	0	
6. Activation	2,800	
7. Security	90	
d. Standard equipment		3,090
e. Major computer items		0
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout and acceptance		<u>0</u>
h. Subtotal (a through g)		41,930
i. Contingencies at approximately 18.5% of above costs		<u>7,770</u>
j. Total line item cost (Section 11.a.1.(a)).		\$ 49,700
k. LESS: Non-Federal contribution		<u>0</u>
l. Net Federal total estimated cost (TEC)		<u>\$ 49,700</u>

10. Method of Performance

Contracting arrangements are as follows:

Design will be on the basis of a negotiated architect-engineer contract. Major equipment requiring long lead time will be purchased by LLNL early in the project on the basis of competitive bidding. To the extent feasible, construction will be accomplished by a fixed-price contract awarded on the basis of competitive bidding. Minor architect-engineering work and activation will be performed by LLNL forces.

a/ Current estimate based on conceptual design revision of January 1995.

1. Title and Location of Project: Contained Firing Facility Addition	2a. Project No. 96-D-105
Lawrence Livermore National Laboratory, Livermore, California (Continued)	2b. Construction Funded

11. Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1996	FY 1997	FY 1998	FY 1999	Total
a. Total project costs						
1. Total facility costs						
(a) Line item (Section 9.j.)	\$ 0	\$ 2,550	\$ 11,400	\$ 23,400	\$ 12,350	\$ 49,700
(b) Plant, Engineering and Design (PE&D).	0	0	0	0	0	0
(c) Operating expense funded equipment	0	0	0	0	0	0
(d) Inventories	0	0	0	0	0	0
(e) Total facility cost (Federal and Non-Federal)	\$ 0	2,550	\$ 11,400	\$ 23,400	\$ 12,350	\$ 49,700
2. Other project costs						
(a) R&D necessary to complete project	\$ 1,195	\$ 110	\$ 0	\$ 0	\$ 0	\$ 1,305
(b) Conceptual design costs	420	40	0	0	0	460
(c) Decontamination & Decommissioning (D&D)	0	0	0	0	0	0
(d) NEPA documentation costs	100	60	0	0	0	160
(e) Other project related costs	450	70	0	0	620	1,140
(f) Total other project costs	\$ 2,165	\$ 280	\$ 0	\$ 0	\$ 620	\$ 3,065
(g) Total project costs	\$ 2,165	\$ 2,830	\$ 11,400	\$ 23,400	\$ 12,970	\$ 52,765
(h) LESS: Non-Federal contribution	0	0	0	0	0	0
(i) Net Federal total project cost (TPC)	\$ 2,165	\$ 2,830	\$ 11,400	\$ 23,400	\$ 12,970	\$ 52,765
b. Related annual costs (estimated life of project--40 years)						
1. Facility operating costs						\$ 610
2. Facility maintenance and repair costs (included in 1 above)						0
3. Programmatic operating expenses directly related to the facility						4,375
4. Capital equipment not related to construction but related to the programmatic effort in the facility						500
5. GPP or other construction related to the programmatic effort in the facility						0
6. Utility costs						190
7. Other costs						0
Total related annual costs						\$ 5,675

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project funding

1. Total facility costs

- (a) Line Item -- No narrative required.
- (b) PE&D -- None.
- (c) Operating expense funded equipment -- None.
- (d) Inventories -- None.

2. Other project costs

- (a) R&D necessary to complete construction -- Scale model testing was performed to provide design basis. Waste stream studies were performed to certify non-reactivity.
- (b) Conceptual design -- Total funding in this classification represents the conceptual design cost and other studies determined to be necessary.
- (c) Decontamination and Decommissioning (D&D) -- None.
- (d) NEPA documentation -- Support cost for the EA process.
- (e) Other project funding costs -- Project support costs of ADM, PSAR/MPR, FESP, Training Start up, and other related project support costs.

b. Related annual costs

- 1. Facility operating costs -- Operating, maintenance and repair costs of the facility are estimated to be \$610,000 per year (based on: operating, maintenance and repair costs of 2.9% of replacement value). This facility is an addition to an existing facility B801.
- 2. Facility maintenance and repair costs -- Included in Facility Operating costs.
- 3. Programmatic Operating Expenses Directly Related to the Facility -- This estimate is for 25 total programmatic and support personnel at \$175,000 average per person in FY 1999, who are currently connected with B801 operations.
- 4. Capital equipment not related to construction but related to the programmatic effort in the facility -- This is an average annual estimate which includes both the small items needed for continuous operation of the facility and the occasional large item over \$100,000 which cannot be described at this time, but can be predicted as needed to maintain technical excellence in efforts conducted in the facility.
- 5. GPP or other construction related to programmatic effort in the facility -- Initially no GPP costs are anticipated but to keep abreast of technology, presently undefined alterations will likely be required in the future.
- 6. Utility costs -- The estimated annual utility cost is \$190,000 based on a projected utility/power cost of \$6.50 per square feet in FY 1999.
- 7. Other related costs -- No narrative required.

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(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Stewardship

1.	Title and Location of Project:	Processing and Environmental Technology Laboratory (PETL), Sandia National Laboratories (SNL), Albuquerque, New Mexico	2a. Project No. 96-D-104 2b. Construction Funded
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SIGNIFICANT CHANGES

- During FY 1996, Processing and Environmental Technology Laboratory (PETL's) mission was re-evaluated and it was determined that a smaller building would suffice. The building size and its costs are currently being reviewed. This review should be completed by March 1997 and resolution of size and cost issues will be necessary for project validation.
- However, there are sufficient carryover funds from FY 1997 to support the Title II effort and initiate construction without the need for additional funds in FY 1998. Full budget authority to complete the project based on current cost estimates is being requested consistent with the new full funding initiative.

DEPARTMENT OF ENERGY
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(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Stewardship

1. Title and Location of Project: Processing and Environmental Technology Laboratory, Sandia National Laboratories (SNL), Albuquerque, New Mexico	2a. Project No. 96-D-104 2b. Construction Funded
3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 2nd Qtr. FY 1996	5. Previous Cost Estimate: None Total Estimated Cost (TEC) -- \$45,900 Total Project Cost (TPC) -- \$49,000
3b. A-E Work (Titles I & II) Duration: 17 months	
4a. Date Physical Construction Starts: 1st Qtr. FY 1998	6. Current Cost Estimate: TEC -- \$ 45,900 TPC -- \$ 49,000
4b. Date Construction Ends: 1st Qtr. FY 2001	
7. <u>Financial Schedule (Federal Funds):</u>	

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1996	\$ 1,800	\$ 180 <u>1/</u>	\$ 1,980	\$ 893
1997	14,100	0	14,100	5,720
1998	29,820	0	0	9,467
1999	0	0	18,920	13,380
2000	0	0	8,600	10,500
2001	0	0	2,300	5,940

8. Project Description, Justification and Scope

The Processing and Environmental Technology Laboratory (PETL) is a new laboratory/office facility to be located on a presently vacant site. The proposed building is a three-story building with a full basement. The Title I preliminary design is complete and the building and its cost are currently under review. The Office/Laboratory consists of two primary functional areas, laboratory and office space. The offices are located at the eastern end of the facility, and the laboratory service areas and loading docks are located at the west end. The building is designed to meet the latest ES&H requirements for facilities of this type. Vibration isolation, pedestrian circulation, emergency egress, separation between laboratory and technician work stations, and separate laboratory service corridors which serve as secondary emergency exits are all design responses to identified user requirements. The building will have a modular design to facilitate varying the size of laboratory and office spaces in minimum time and at low costs, as user requirements change. The building is oriented on an east-west axis to achieve maximum opportunity for solar gain along the south elevations.

1/ Internal reprogramming of \$180,000 was provided to allow management efficiencies achievable through coordination of engineering and design contracts.

1. Title and Location of Project: Processing and Environmental Technology Laboratory, Sandia National Laboratories (SNL), Albuquerque, New Mexico (Continued)	2a. Project No. 96-D-104 2b. Construction Funded
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8. Project Description, Justification and Scope (Continued)

Utility chases will extend from the basement to the roof deck and will have walls of painted gypsum board over metal studs with a 2-hour fire rating. Generally, interior walls are gypsum board over metal studs. Elevator shafts will be of 8 inch concrete masonry construction. Fire-rated partitions around laboratory areas are of fully grouted 8 inch concrete masonry, continuous to the underside of the floor surface to achieve a 4-hour rating. Floors will be hardened exposed concrete in the basement, utility chases, stairwells, and undeveloped office/lab areas. The structural system will consist of a cast-in-place reinforced concrete frame supporting a cast-in-place reinforced waffle slab system at the elevated floors and precast concrete double tee units at the roof. The exterior wall system consists of cast-in-place walls, columns and spandrel beams with standard gray precast concrete window units set in place between the spandrel beams and columns. Air intake/supply shafts are enclosed with the precast concrete flat panels.

The heating, ventilating, and air conditioning systems include a double duct, variable air volume (VAV), perimeter heating/cooling system, and a core or interior single duct VAV system. Heating will be provided by piped hot water generated at a heat pump chiller. The chiller will provide cold water for building cooling and test equipment. Interior plumbing systems will include sanitary waste, domestic hot and cold water, compressed air, natural gas, and chilled water supply and return. Exhaust will be provided by utility fans located at the roof level, connected to exhaust duct risers in chases. Site utilities include a primary electric feeder, signal duct, steam and condensate lines, water, natural gas, and sanitary sewer. Area improvements will include security fencing, storm drains inlets, and service and driveway areas. Landscaping, including trees, shrubs, irrigation system and gravel, will be provided consistent with existing landscape practices. The building will be designed to conserve energy.

The PETL is an important element that will enable SNL to continue to provide exceptional research and development capability in support of the Department of Energy (DOE).

A publicly-stated objective of the DOE is to use an aggressive R&D program to develop production processes which will offer significant cost reductions and minimize the use of toxic materials. The synergism represented by PETL meets the DOE's objective in that it collocates individuals responsible for identifying and developing new materials and processes with those translating them to application.

The focus of PETL is the development, characterization, and application of modern processing while at the same time ensuring the safety of the environment and personnel, and producing products required for nuclear weapons applications. PETL allows the integration of real-time, on-line diagnostics, test structures in processing lines for "self-identification" of processing problems. The substitution of environmentally safer processing chemicals will be analyzed to minimize design impact and to assess the affect on long-term compatibility. Analytical support for production of non-nuclear components will replace services provided by integrated complex plants, as the manufacturing complex is reduced in size and Manufacturing Development Engineering (MDE) increases.

The primary mission of Sandia National Laboratory is the design of the non-nuclear components in nuclear weapons. The goal of the PETL is to maintain and to enhance SNL's capability to provide high-quality engineering research and development (R&D) to support the DOE weapons program while at the same time meeting new environmental, safety, and health (ES&H) requirements and responding to the reconfiguration of the Nuclear Weapons Complex (NWC). PETL will provide R&D facilities for personnel responsible for developing materials and processes associated with weapon production. The materials and processes R&D has a strong waste minimization content and also meets performance, reliability, and cost requirements.

PETL occupants will include the following centers of excellence: the Materials and Process Sciences Center, the Engineered Materials and Processes Center, and parts of the Environment Center and the Microelectronics Center.

SNL is committed to supporting programmatic needs for materials, resolving environmental problems associated with weapon production, and conforming with environmental and safety regulations. This commitment is reflected in SNL's efforts to combine the above-mentioned centers of excellence, which are currently dispersed throughout the SNL site.

8. Project Description, Justification and Scope (Continued)

1. Title and Location of Project: Processing and Environmental Technology Laboratory, Sandia National Laboratories (SNL), Albuquerque, New Mexico (Continued)	2a. Project No. 96-D-104 2b. Construction Funded
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DOE is faced with developing a more efficient complex to produce and to dismantle weapons, as well as to address ES&H issues affecting SNL operations and nuclear weapon production. Without additional space, efforts involving materials compatibility, aging, and reliability will be severely limited. These efforts are essential in certifying the reliability of the nuclear weapons stockpile. Without new space, SNL would continue to occupy temporary buildings and substandard and leased space. Modifications of current laboratories are not feasible, because they would require complete replacement of basic services, such as heating, ventilating and cooling. For example, the main existing materials research laboratory has a ventilation system that spreads any gas or vapors throughout the building if a release occurs inside a fume hood.

PETL will provide facilities for staff seeking timely solutions to the following critical problems:

- Assuring safety and reliability of a smaller stockpile incorporating new materials and processes for production.
- Elimination of some materials from nuclear weapons because of production/usage restrictions, or total bans and increased requirements to minimize occupational exposure, with minimum effect on the reliability of nuclear weapons.
- Substitution of environmentally safer materials and processes during nuclear weapon production, with minimum effect on the reliability of nuclear weapons.
- Elimination/reduction of hazardous waste (radioactive, mixed, or chemically hazardous) during nuclear weapon production and better treatment (including detoxification or stabilization) of newly generated hazardous wastes.
- Dismantling nuclear weapons in an environmentally acceptable and safe manner.
- Compliance by SNL and the Nuclear Weapons Complex with ES&H laws, regulations, DOE orders, and industry standards.

Currently, materials activities are divided among nine different buildings. PETL will allow these activities to be centralized into one facility. Because most of the current laboratories are located in old facilities, the move to PETL will assist in conforming to current and expected regulations, DOE orders, and best industry ES&H practices.

PETL will enable the materials organizations to conform with best industry ES&H practices. The new building will be designed to conduct environmentally and occupationally safe R&D involving hazardous materials used in weapon production.

Funds appropriated in prior years are sufficient to complete Title II design and initiate construction in FY 1998.

1. Title and Location of Project: Processing and Environmental Technology Laboratory, Sandia National Laboratories (SNL), Albuquerque, New Mexico (Continued)	2a. Project No. 96-D-104 2b. Construction Funded
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8. Project Description, Justification and Scope (Continued)

Removal Plan

The following buildings will be vacated by organizations proposing to move to the PETL:

<u>Building</u>	<u>Year Acquired</u>	<u>Building Size (Net Square Feet)</u>	<u>Space Vacated (Net Square Feet)</u>	<u>Organization(s)</u>
805	1959	48,471	23,748	1700/1800
806	1961	39,640	7,424	1700/1800
807	1966	52,845	2,317	1700/1800
823	1982	79,667	1,795	6600
828	1946	11,475	2,600	1800
894	1950	75,514	3,213	1800
T-47-49	1979	3,273	<u>1,230</u>	1800
			42,327	

Building 828 is considered substandard and included in the SNL substandard and temporary abandoned building decontamination and disposal program under a separate, future expense-funded project. It is expected the other space vacated by future PETL occupants will be backfilled by technical and administrative organizations as part of the Lab-wide space planning strategy.

1. Title and Location of Project: Processing and Environmental Technology Laboratory, Sandia National Laboratories (SNL), Albuquerque, New Mexico (Continued)	2a. Project No. 96-D-104 2b. Construction Funded
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9. Details of Cost Estimate

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 6,031
(1) Engineering design and inspection at approximately 12.0 percent of construction costs, (Item C) (Design, Drawings, and Specifications \$1,500)	\$ 3,231	
(2) Construction Management (Item C)	862	
(3) Project Management at 7.2 percent of Construction Costs	1,938	
b. Land and land rights	0	
c. Construction costs		26,925
1. Improvements to land	323	
2. Buildings	24,771	
3. Other structures	0	
4. Utilities	1,831	
5. Special facilities	0	
d. Standard equipment		7,216
e. Major computer items		0
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout and acceptance		<u>0</u>
h. Subtotal (a through g)		40,172
i. Contingencies at approximately 14.2 percent of above costs		<u>5,728</u>
j. Total line item cost (Section 11.a.1.(a))		\$ 45,900
k. LESS: Non-Federal contribution		<u>0</u>
l. Net Federal total estimated cost (TEC)		<u>\$ 45,900</u>

10. Method of Performance

Design and inspection shall be performed under a negotiated architect-engineering contract. Construction and procurement shall be accomplished by fixed-price contracts awarded on the basis of competitive bidding.

1. Title and Location of Project: Processing and Environmental Technology Laboratory, Sandia National Laboratories (SNL), Albuquerque, New Mexico (Continued)	2a. Project No. 96-D-104 2b. Construction Funded
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12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project funding

1. Total facility costs

- (a) Line Item -- Narrative not required.
- (b) PE&D -- None.
- (c) Operating expense funded equipment -- None.
- (d) Inventories -- None.

2. Other project costs

- (a) R&D necessary to complete project -- None.
- (b) Conceptual design costs -- Prepared by Dekker and Associates, Architects, Albuquerque, New Mexico, in January 1990, and then revised in November 1992.
- (c) Decontamination and Decommissioning -- None.
- (d) NEPA documentation costs -- An Environmental Assessment is currently being prepared.
- (e) Other project related costs -- Includes in-house engineering support, project development and project management costs prior to authorization, a Safety Assessment, and non-dedicated support activities throughout this project life.

b. Related annual costs (estimated life of project--50 years)

Annual operating cost will be reduced as a result of improved system reliability, modern equipment and systems, and higher efficiencies. This project relocated existing activities to a new facility under revitalization. The estimated useful life of this new facility is estimated at 50 years. Operating costs, maintenance and repair costs and utility costs are estimated for typical office/laboratory facilities at SNL/NM. Capital Equipment figures are not related to construction, but estimated to maintain annual programmatic effort. Programmatic operating expenses include salaries and supplies for approximately 240 people estimated at \$229,518 per person per year.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Stewardship

1.	Title and Location of Project:	Atlas Los Alamos National Laboratory, Los Alamos, New Mexico	2a. Project No. 96-D-103 2b. Construction Funded
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SIGNIFICANT CHANGES

- As a result of a Tri-Lab Review held in June 1996 which assigned the hydrodynamic effort to LANL, several design parameters of the Atlas machine, such as discharge voltage and peak current, have been changed in order to provide a hydrodynamic pulsed power machine. This redesigned machine will be larger, which will require its installation in a different building than originally planned. However, there is no change in TEC, TPC, or the scheduled completion of the facility.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Stewardship

1. Title and Location of Project: Atlas Los Alamos National Laboratory, Los Alamos, New Mexico	2a. Project No. 96-D-103 2b. Construction Funded
3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 1st Qtr. FY 1996	5. Previous Cost Estimate: Total Estimated Cost (TEC) -- \$ 43,300 Total Project Cost (TPC) -- \$ 48,500
3b. A-E Work (Titles I & II) Duration: 15 months	
4a. Date Physical Construction Starts: 3rd Qtr. FY 1997	6. Current Cost Estimate: TEC -- \$ 43,300 TPC -- \$ 48,500
4b. Date Construction Ends: 3rd Qtr. FY 1999	

7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1996	\$ 8,400	\$ 0	\$ 8,400	\$ 1,000
1997	15,100	0	15,100	18,000
1998	19,800	0	13,400	13,900
1999	0	0	6,400	10,400

8. Project Description, Justification and Scope

Above ground experiments (AGEX) that address secondary weapons physics require an energy-rich, high energy density environment. To simultaneously achieve the full spectrum of conditions present in a nuclear weapon, an underground test is required. In above-ground experiments in the laboratory, one can examine individual aspects of secondary weapons physics using three classes of facility: pulsed power for high energy; high energy lasers for high power; and ultra high-intensity lasers for extreme energy-density conditions. No single technology can access the full range of conditions to meet the needs of the weapons program for above-ground experiments.

This project provides enhanced Los Alamos National Laboratory (LANL) pulsed power experimental capability (technical stewardship of capability in an era of test restraints) to support AGEX for stockpile stewardship.

The scope of work includes:

- Design, procurement, assembly, and installation of the Atlas 45-50 Megampere, 30-36 Megajoule capacitor bank with associated controls and power supplies in Buildings 125 and 294 at TA-35.

1. Title and Location of Project: Atlas Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)	2a. Project No. 96-D-103 2b. Construction Funded
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8. Project Description, Justification and Scope (Continued)

- Modification of approximately 34,000 square feet of Building 125 at TA-35 to support Special Facilities Equipment (SFE) installation and completion of operational upgrades to the facility.
- Utilization of existing 1,430 MVA generator in Building 301 at TA-35 for electrical power.
- Installation of a power storage equipment area of 2,600 square feet in Building 294 and upgrades to the control room area of 1,600 square feet in Building 125 at TA-35; also provides power distribution and diagnostic cabling to experiment in Building 125.
- Completion of site work and utilities to support the use of up to 3 Government-Furnished diagnostic trailers and installation of new dielectric oil storage tank adjacent to Building 125 at TA-35.

This project will support a weapons experimental program that is an alternative to the underground nuclear testing program. These experiments are an essential part of any nuclear weapons program. Because of the extreme conditions achieved in a thermonuclear explosive, no single technology can hope to simulate all weapons physics. One must make increasing sacrifices in experimental volume and duration to reach conditions nearer to those found in nuclear explosives. Existing facilities are unable to reach the required conditions. A cost/benefit analysis was performed to identify the breakpoints in technology required to provide credible above-ground simulation capabilities at minimum cost.

The use of the existing Los Alamos Antares facility with internal modifications of power, HVAC, and partition systems will permit a cost-effective, conveniently located facility to be added to the existing inventory of experimental facilities supporting high energy density physics at LANL. The chosen site will permit sharing the existing 1,430 MVA generator in Building 301 at LANL.

A summary of key justification items for Atlas follows:

- Atlas addresses an essential capability requirement for DOE's stockpile stewardship program.
- Without underground testing, AGEX are the best means available to exercise and validate design judgement.
- The United States entered the extended test moratorium in July 1993. AGEX must help mitigate the technical risks and the loss of stockpile-related judgement associated with a no-test environment by exercising weapons skills.

The FY 1998 funds will be used to continue long-lead procurements, complete the building modifications, and install Atlas pulsed power equipment.

1. Title and Location of Project: Atlas
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)

2a. Project No. 96-D-103
2b. Construction Funded

9. Details of Cost Estimate

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 8,585
(1) Facility engineering design and inspection at approximately 29 percent of construction costs	\$ 737	
(2) SFE Engineering Design and Inspection at approximately 22 percent of SFE costs (Item E) ...	5,124	
(3) Project and construction management at approximately 10 percent of construction costs (Item C & E)	2,724	
b. Land and land rights		0
c. Construction costs		2,523
1. Improvements to land	99	
2. Buildings modifications	2,424	
3. Other structures	0	
4. Utilities	0	
5. Special facilities	0	
d. Standard equipment		0
e. Special facilities equipment (SFE)		23,624
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout and acceptance		<u>146</u>
h. Subtotal (a through g)		\$ 34,878
i. Contingencies at approximately 24 percent of above costs		<u>8,422</u>
j. Total line item cost (Section 11.a.1.(a))		\$ 43,300
k. LESS: Non-Federal contribution	<u>0</u>	
l. Net Federal total estimated cost (TEC)		<u>\$ 43,300</u>

10. Method of Performance

Facility, design and inspection will be performed under a negotiated architect or engineering contract. SFE design and inspection is to be performed by LANL personnel. Construction and construction procurement will be accomplished by fixed price contracts awarded on the basis of competitive bidding. Procurement of Government Furnished Equipment will be performed by LANL and will be accomplished by competitive fixed price or CPFF contracts. SFE will be installed by LANL and the site services contractor.

1. Title and Location of Project: Atlas
 Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)

2a. Project No. 96-D-103
 2b. Construction Funded

11. Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1996	FY 1997	FY 1998	FY 1999	Total
a. Total project costs						
1. Total facility costs						
(a) Line Item (Section 9.j.)	\$ 0	\$ 1,000	\$ 18,000	\$ 13,900	\$ 10,400	\$ 43,300
(b) Plant, Engineering and Design (PE&D).	0	0	0	0	0	0
(c) Operating expense funded equipment.	0	0	0	0	0	0
(d) Inventories	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
(e) Total facility costs (Federal and Non-Federal)	\$ 0	\$ 1,000	\$ 18,000	\$ 13,900	\$ 10,400	\$ 43,300
2. Other project costs						
(a) R&D necessary to complete project	\$ 3,089	\$ 260	\$ 42	\$ 0	\$ 0	\$ 3,391
(b) Conceptual design costs	577	78	0	0	0	655
(c) Decontamination & Decommissioning (D&D)	0	0	0	0	0	0
(d) NEPA documentation costs	4	34	0	0	0	38
(e) Safety documentation	0	31	14	0	0	45
(f) Acceptance and turnover	0	0	0	791	0	791
(g) Other project related costs	<u>0</u>	<u>0</u>	<u>0</u>	<u>280</u>	<u>0</u>	<u>280</u>
(h) Total other project costs	\$ <u>3,670</u>	\$ <u>403</u>	\$ <u>56</u>	\$ <u>1,071</u>	\$ <u>0</u>	\$ <u>5,200</u>
(i) Total project costs	\$ 3,670	\$ 1,403	\$ 18,056	\$ 14,971	\$ 10,400	\$ 48,500
(j) LESS: Non-Federal contribution	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
(k) Net Federal total project cost (TPC)	\$ <u><u>3,670</u></u>	\$ <u><u>1,403</u></u>	\$ <u><u>18,056</u></u>	\$ <u><u>14,971</u></u>	\$ <u><u>10,400</u></u>	\$ <u><u>48,500</u></u>
b. Related annual costs (estimated life of project--20 years)						
1. Facility operating costs						\$ 2,500
2. Facility maintenance and repair costs						1,000
3. Programmatic operating expenses directly related to the facility						0
4. Capital equipment not related to construction but related to the programmatic effort in the facility						0
5. GPP or other construction related to the programmatic effort in the facility						0
6. Utility costs						137
7. Other costs						<u>0</u>
Total related annual costs						\$ <u><u>3,637</u></u>

1. Title and Location of Project: Atlas
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)

2a. Project No. 96-D-103
2b. Construction Funded

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

- a. Total project funding
 - 1. Total facility costs
 - (a) Line Item -- As described.
 - (b) PE&D -- None.
 - (c) Operating expense funded equipment -- None.
 - (d) Inventories -- None.
 - 2. Other project costs
 - (a) R&D necessary to complete construction -- Prototype development.
 - (b) Conceptual design -- Includes F&OR's, CDR, CPDS and Value Engineering
 - (c) Decontamination and Decommissioning (D&D) -- None.
 - (d) NEPA documentation -- Includes effort required to obtain NEPA Categorical Exclusion
 - (e) Other project related funding -- Includes PHA, ORE, ORR and Startup activities
- b. Related annual costs
Includes Atlas staffing, maintenance, general repairs and utility costs.

1. Title and Location of Project: Nuclear Weapons Stockpile Stewardship
Facilities Revitalization, Phase VI, Various Locations (Continued)

2a. Project No.: 96-D-102
2b. Construction Funded

Core Stockpile Management					
Operations & Maintenance	\$ 1,527,908	\$ 1,409,576	\$ 1,340,787	\$ 1,294,499	\$
Construction Line Items	<u>112,725</u>	<u>112,725</u>	<u>90,536</u>	<u>0</u> f/	
Subtotal, Core Stockpile Management	\$ <u>1,640,633</u>	\$ <u>1,522,301</u>	\$ <u>1,431,323</u>	\$ <u>1,294,499</u> e/	\$ <u>TBD</u>
Enhanced Surveillance					
Operations & Maintenance	18,872	18,872	55,000	60,000	TBD
Advanced Manufacturing, Design and Production Technologies					
Operations & Maintenance	44,377	44,377	100,763	103,181	TBD
Radiological/Nuclear Accident Response					
Operations & Maintenance	\$ 70,010	\$ 70,010	\$ 75,800	\$ 79,300	\$
Construction Line Items	<u>900</u>	<u>900</u>	<u>3,825</u>	<u>0</u> f/	
Subtotal, Rad/Nuclear Accident Response	\$ <u>70,910</u>	\$ <u>70,910</u>	\$ <u>79,625</u>	\$ <u>79,300</u>	\$ <u>TBD</u>
Tritium Source					
Operations & Maintenance	\$ 75,000	\$ 75,000	\$ 150,000	\$ 184,485	\$
Construction Line Items	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u> f/	
Subtotal, Tritium Source	\$ <u>75,000</u>	\$ <u>75,000</u>	\$ <u>150,000</u>	\$ <u>184,485</u>	\$ <u>TBD</u>
Materials Surveillance					
Operations & Maintenance	\$ 151,748	\$ 109,811	\$ 112,120	\$ 107,000	\$
Construction Line Items	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u> f/	
Subtotal, Materials Surveillance	\$ <u>151,748</u>	\$ <u>109,811</u>	\$ <u>112,120</u>	\$ <u>107,000</u>	\$ <u>TBD</u>
Subtotal, Directed Program	\$ 2,001,540	\$ 1,841,271	\$ 1,928,831	\$ 1,828,465	f/ \$ TBD
Adjustment	<u>(124,078) a/</u>	<u>(124,078) a/</u>			
Subtotal, Weapons Stockpile Management	\$ <u>1,877,462</u>	\$ <u>1,717,193</u>	\$ <u>1,928,831</u>	\$ <u>1,828,465</u>	\$ <u>TBD</u>
Comparability Adjustment		<u>160,269 b/</u>			
Total, Management, New Budget Authority	<u><u>1,877,462</u> c/</u>	<u><u>1,877,462</u> c/</u>	<u><u>1,928,831</u></u>	<u><u>1,828,465</u></u>	<u><u>1,788,000</u></u>
Defense Asset Acquisition - Defense Programs - Management	\$ <u><u>0</u></u>	\$ <u><u>0</u></u>	\$ <u><u>0</u></u>	\$ <u><u>452,969</u> f/</u>	\$ <u><u>558,737</u></u>

Summary

Core Stockpile Management	\$ 1,640,633	<u>c/,d/</u>	\$ 1,522,301	<u>c/,d/</u>	1,431,323	\$ 1,294,499	f/	\$ TBD
Enhanced Surveillance	18,872		18,872		55,000	60,000		TBD
Advanced Manufacturing, Design and Production Technologies	44,377		44,377		100,763	103,181		TBD
Radiological/Nuclear Accident Response	70,910		70,910		79,625	79,300	f/	TBD
Tritium Source	75,000		75,000		150,000	184,485	f/	TBD
Materials Surveillance	151,748		109,811		112,120	107,000	f/	TBD
Total, Weapons Stockpile Management (Comparable)	\$ <u>2,001,540</u>		\$ <u>1,841,271</u>	<u>a/,b/</u>	\$ <u>1,928,831</u>	\$ <u>1,828,465</u>	f/	\$ <u>1,788,000</u>

a/ Use of prior year balances: \$81,867,064 operating; \$13,398,961 capital equipment; \$28,811,585 construction

b/ Reflects funding transferred in FY 1997 to Weapons Program Direction \$157,381 and to the Office of Environment, Safety and Health \$2,888

c/ Reflects FY 1996 Omnibus Consolidated Rescissions and Appropriations Act of 1996--\$2,809,000 Core Stockpile Management

d/ Includes Stockpile Management allocation of bottom line Contractor Streamlining Savings (\$18,900,000)

e/ Reflects the transfer of \$7,650,000 from Environmental Management to support waste management activities at the Kansas City Plant and Savannah River Site

f/ Reflects transfer of Stockpile Management construction line items to Defense Asset Acquisition account.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
WEAPONS ACTIVITIES
(Tabular dollars in thousands, Narrative in whole dollars)

WEAPONS STOCKPILE MANAGEMENT
PROGRAM MISSION

Note: Detailed site funding for Stockpile Management is provided in the Defense Program Executive Budget Summary.
Construction line item data sheets are included in the Defense Asset Acquisition account - Management detail, following the Weapons Management budget narrative.

The Weapons Stockpile Management program supports the enduring stockpile as directed in the Nuclear Weapons Stockpile Plan; assures the availability of adequate supplies of tritium to meet the requirements of the enduring stockpile; provides safe and secure storage of nuclear materials and components to prevent proliferation of capabilities, technologies and systems; provides the ability to respond to potential or real weapon incidents/accidents, and also to respond to continuing and evolving nuclear terrorist threats; and provides a flexible infrastructure capable of supporting changing stockpile sizes.

GOALS:

- Maintain confidence in the safety, security, reliability and performance of the enduring U.S. stockpile while simultaneously supporting U.S. arms control and nonproliferation policies,
- Provide an appropriately sized, affordable, environmentally sound, and effective production complex to provide component and weapon replacements when needed, including limited lifetime components and tritium, and
- Provide the ability to reconstitute nuclear weapon production capacities, consistent with Presidential Directives, the Nuclear Posture Review, and the START II Treaty, should national security so demand in the future.

OBJECTIVES:

- Reduce the weapons stockpile by dismantling 1,300 weapons in FY 1998 without adversely affecting the environment, public safety and health.
- Maintain the reliability of the future stockpile by developing a replacement source for tritium.
- Determine the size and scope of the nuclear weapons complex by completing the Stockpile Stewardship and Management Programmatic Environmental Impact Statement (PEIS) process (*completed 12/19/1996*).

PERFORMANCE MEASURES:

Specific performance measures are included in the program element descriptions. Significant overall measures for FY 1998 are:

- Complete design assessment and begin full production operations for the first Life Extension Program
- Dismantle about 1,300 Weapons
- Validate Enhanced Surveillance models developed in FY 1997 and utilize techniques to evaluate, detect and determine the impacts of various nuclear and nonnuclear defects found in the stockpile.
- Support the Dual Track Strategy for Tritium
- Implementation of decisions resulting from the Stockpile Stewardship and Management Programmatic Environmental Impact Statement
- Implementation of the Advanced Manufacturing, Design and Production Technologies initiative

SIGNIFICANT ACCOMPLISHMENTS AND PROGRAM SHIFTS:

During **FY 1996**, the following significant accomplishments were realized:

- reduced the backlog of retired weapons by dismantling 1,064 warheads;
- assured adequate levels of testing for evaluation of all weapons in the stockpile;
- maintained warheads through a robust surveillance program that detected deficiencies in the stockpile through destructive and nondestructive testing;
- maintained the nuclear weapons stockpile as depicted in the FY1996-2001 Nuclear Weapons Stockpile Plan, by supporting Limited Life Component Exchange (LLCE) schedules;
- developed and implemented a training and certification program for Department of Energy Nuclear Explosive Safety Study Group members and reviewers;
- maintained stockpile surety; improved surety processes, assessments, and methodologies;
- developed and published revised surety orders and standards that integrate weapon safety with facility safety;
- supported the development of the pit rebuild capability program;
- initiated activities to support the B61-11 strategic bomb;
- support for the W87 Life Extension Program;
- supported development and application of Acorn reservoir technology to the appropriate stockpiled weapons;
- continued upgrade of the B83-1 strategic bomb;
- issued the final Tritium Supply and Recycling PEIS in October 1995 and the Secretarial Record of Decision in December 1995;
- initiated the dual-track strategy for a new, assured tritium source;
- selected Burns & Roe Enterprises Incorporated as the prime engineering contractor to support the Accelerator Production of Tritium track of the dual-track tritium strategy;
- issued the draft Stockpile Stewardship and Management Programmatic Environmental Impact Statement;
- initiated activities in support of the Enhanced Surveillance Program; and
- initiated the W76 Dual Revalidation Program.

In addition to continuing to support the activities initiated in FY 1996, initiatives for **FY 1997** are:

- begin full production of the Safeguards Transporter;
- fund the Defense Programs pension and sales tax liabilities at Mound and Pinellas;
- sponsor and participate in the DOE Lead Federal Agency Weapons Accident exercise;
- issue the Pantex Site-wide Environmental Impact Statement (EIS) and provide support to the Los Alamos National Laboratory (LANL) and Sandia National Laboratories (SNL) Site-wide EISs;
- dismantle 944 warheads;
- fund one-half of the activities of the National Resource Center for Plutonium in Amarillo, Texas;
- issuance of both the final Stockpile Stewardship and Management PEIS and the Secretarial Record of Decision;
- initiation of a Plant Fellowship Program;
- provide the complex with advanced capabilities by infusing new product and process technologies.

FY 1998 HIGHLIGHTS

The FY 1998 request for Operations and Maintenance is essentially equal to the FY 1997 appropriation for Operations and Maintenance. Our FY 1998 base program recognizes savings resulting from program progression or nonrecurring FY 1997 activities which are used to accommodate increases in Enhanced Surveillance (+\$5 million) and Tritium Supply (+\$34.5 million). In addition, the request reflects the transfer of funding and management responsibilities from Stockpile Stewardship and the Office of Nuclear Energy for the operation of nuclear materials facilities at LANL (+\$21.4 million) and the transfer of funding from the Office of Environmental Management for the cost of managing newly generated waste associated with FY 1998 planned activities at the Kansas City Plant and the Savannah River Site (+\$7.65 million). The major change in funding for line-item construction projects, now shown in the Defense Assets Acquisition account is the transition to full up-front funding for logical phases of construction projects. New projects for FY 1998 include: design funding for the Stockpile Management Restructuring Initiative at the Savannah River Site (TEC-\$68.8 million, FY 1998-\$14.3 million) and Y-12 Plant (TEC-\$41.6 million, FY 1998-\$7.3 million), design funding for Tritium (TEC-TBD, FY 1998-\$168.6 million) and the Tritium Extraction Facility (TEC-TBD, FY 1998-\$39.5 million). Funding is also included to complete construction of the Chemistry and Metallurgy Research Building (TEC-\$174.1 million, FY 1998-\$106.4).

Enhanced Surveillance The Enhanced Surveillance Program (ESP) is an integrated program among the nuclear weapons laboratories and the production plants to develop modern technologies for detecting degradation and predicting service lives of nuclear weapons and their materials and components. It is a long-term, continually evolving research and development effort with six major focus areas: material characterization and surveillance, materials aging model development, component surveillance and diagnostics, component performance models, enhanced systems testing, and system performance models. ESP is a logical step between the traditional surveillance program and anticipated weapon refurbishment. It will be closely coordinated and integrated with other initiatives such as the Accelerated Strategic Computing Initiative (ASCI) and Advanced Manufacturing, Design and Production Technologies (ADaPT).

Advanced Manufacturing, Design and Production Technologies (ADaPT) In past years, a large weapons production complex provided the capability and capacity to rapidly produce new weapons and fix problems in the stockpile. While new weapons are not planned, the Department must maintain a reliable, quality production capability to support the weapons stockpile as it ages. To meet that challenge, the complex is entering a period of downsizing to guarantee an affordable and viable production capability for the future. In planning for this activity, it has been recognized by the Department that emerging technologies in agile manufacturing and enterprise integration must be adopted throughout the complex and that opportunities for a less costly, smaller footprint and environmentally sound production processes must be pursued. The Congress added funding and direction to initiate these efforts in FY 1997. This funding was allocated to all plants and laboratories and provided for work in enterprise modeling, product realization, model-based design and manufacturing, and the development of a laser-cutting workstation for application to workload needs in the weapons program. Beginning in FY 1998, the program is integrated with existing efforts in Process Development at the production plants, and will be continued at essentially the same level of effort.

Tritium The FY 1998 activities will continue to improve the knowledge base from which the Department will make its technology selection. The information will enable DOE to have a better understanding of the life cycle costs for each of the two tracks. The Accelerator Production of Tritium (APT) track will complete initial key demonstrations of the low-energy part of the accelerator, complete target/blanket low-power tests, test and analyze the irradiated target/blanket specimens, and begin preliminary plant design. The site specific EIS at Savannah River Site will also be completed. The Commercial Light Water Reactor track will make conditional selections of reactor(s) and award contracts preparatory to the purchase of a reactor or irradiation services. This program will also complete multi-site NEPA documentation and other inputs to the planned FY 1998 down selection process. The program plans to initiate engineering design for construction of the extraction facility at Savannah River, complete qualification of vendors for Lead Test Assembly components, and fabricate/initiate establishment of capability for post-irradiation examination of the lead test assembly.

Stockpile Management Restructuring Initiative

The Stockpile Management Restructuring Initiative will support the implementation of Departmental decisions related to production facility downsizing or relocation of missions consistent with the Stockpile Stewardship and Management Programmatic Environmental Impact Statement and the Tritium Supply and Recycling PEIS Records of Decision. The Record of Decision for restructuring the stockpile management complex was announced on December 19, 1996. It involves the downsizing in place of weapons assembly/disassembly

and high explosives at the Pantex Plant, nonnuclear component fabrication at the Kansas City Plant, weapons secondary and case fabrication at the Y-12 Plant, consolidation of existing tritium operations at the Savannah River Site and the reestablishment of a small pit component fabrication capacity at the Los Alamos National Laboratory. In FY 1998, the Department is proceeding with engineering design activities at the Y-12 Plant and the Savannah River Site. Funding for the design of these facilities is included in the Defense Fixed Asset Acquisition account. At the Los Alamos National Laboratory, Kansas City Plant, and Pantex Plant, FY 1998 efforts will focus on conceptual design activities in preparation for the initiation of construction project line items in FY 1999.

FACILITY OPERATIONS:

Weapons Stockpile Management activities are conducted at four production facilities and three national laboratories. The production facilities include the Kansas City Plant- Kansas City, Missouri, operated by Allied Signal Aerospace; the Pantex Plant-Amarillo, Texas, operated by Mason & Hanger; the Y-12 Plant-Oak Ridge, Tennessee, operated by Lockheed Martin Energy Systems; and the Savannah River Site-Aiken, South Carolina, operated by Westinghouse Savannah River Company. The national laboratories include Sandia National Laboratories-Albuquerque, New Mexico, and Livermore, California, operated by Lockheed Martin; Los Alamos National Laboratory-Los Alamos, New Mexico; and Lawrence Livermore National Laboratory-Livermore, California, operated by the University of California. Other miscellaneous locations are funded through the Weapons Stockpile Management Program as noted on the funding by location table which is included in the Weapons Activities Executive Summary.

The nuclear weapons complex is expected to experience ongoing consolidation over the next five to 10 years. The goal of the consolidation effort is to configure into a complex that is smaller, more flexible, and much less expensive to operate. By the year 2001, nonnuclear manufacturing and processing capabilities will be consolidated at the Kansas City Plant, the Savannah River Site, the Los Alamos National Laboratory (LANL), and Sandia National Laboratories (SNL).

Four important Environmental Impact Statements (EIS) have recently been completed or are underway within the Department that will assist in defining alternatives that will lead to a consolidated nuclear weapons complex in the twenty-first century: 1) a Stockpile Stewardship and Management PEIS which was completed in early FY 1997 2) a Pantex Site-wide Environmental Impact Statement (SWEIS) which was completed in early FY 1997; 3) a LANL SWEIS to be completed by the summer of 1997; and 4) a SNL SWEIS to be initiated early in FY 1997.

Beginning in FY 1998, the Stockpile Management Program will budget for and oversee the operation of nuclear materials facilities at the Los Alamos National Laboratory previously supported through the Stockpile Stewardship Program and the Office of Nuclear Energy. As such, \$21.4 million has been transferred into the Stockpile Management budget request. This approach will allow for the alignment of funding and corporate management responsibility, and will ensure stability in managing the overall safety and operating envelope of these facilities.

Additionally, EM is leading an effort to establish a task force to re-engineer the Department's Waste Management Program. One option under consideration involves the transfer of responsibility and funding for the management of newly generated waste back to the generator (PSO). In FY 1998, a pilot project for this transition is begun at the Savannah River Site and Kansas City Plant. A request of \$7.6 million is included in the Stockpile Management for these efforts.

CONCEPTUAL DESIGN REPORTS AND POST-CONCEPTUAL DESIGN ENGINEERING:

While construction activities in support of the Stockpile Management program have been transferred to the Defense Asset Acquisition account, there are two Conceptual Design Reports (CDR) for new construction activities that are being carried out during the budget period which will exceed \$3 million. Both of these CDRs were initiated in FY 1996 following formal Congressional notification. The first will support the APT track of the dual-track strategy for a new tritium source. The estimated cost of the conceptual design effort is \$74 million. The second conceptual design supported the Stockpile Stewardship and Management (SS&M) Programmatic Environmental Impact Statement. Specifically, this CDR supports the reestablishment of a small pit component fabrication capacity at the Los Alamos National Laboratory. This CDR and other pre-Title I activities are estimated to cost approximately \$12 million.

BUDGET CONTENTS:

The Weapons Stockpile Management budget request is presented within six subprograms:

Core Stockpile Management: This program includes lifetime surety, maintenance, surveillance, evaluation, repair, and reliability of the enduring stockpile; weapons dismantlement and disposal; maintenance of weapons design and production capability to include archiving and life extension studies, retrofits, etc.; development of safe weapon assembly and disassembly processes; development and operation of safe, secure systems for transporting nuclear weapons and components; enhanced surveillance activities to extend capability to predict service lives of nuclear weapons and their materials and components; and operation of a complex that meets environment, safety, and health requirements. This program also includes the consolidation of nonnuclear manufacturing efforts within the weapons complex, including the transfer and requalification of 25 technologies and processes at various receiver sites through nonnuclear reconfiguration.

Enhanced Surveillance: The Enhanced Surveillance Program has been implemented to address the uncertainty of the aging stockpile. The absence of new weapon system development and a downsized production complex makes it difficult to correct defects as rapidly as before. The ESP will develop tools, techniques, and models for measuring, qualifying, calculating, and predicting the effects of aging on weapons materials and components and understanding these effects as they impact weapons safety and reliability.

Advanced Manufacturing, Design and Production Technologies: The Advanced Manufacturing, Design & Production Technologies program will focus on re-engineering and modernizing the weapons complex into a modern, agile, and fully integrated operation capable of responding to a wide range of production requirements. This effort encompasses enterprise integration which is aimed at improving information flow and the way the complex accomplishes its day-to-day business; agile manufacturing which is concerned with the development of computer aided/automated direct manufacturing systems utilizing new secure connectivity; process development which focuses on continuous and innovative improvement of individual manufacturing procedures and incorporation of advanced systems into the complex; and the development and documentation of a hedge strategy to rapidly expand production capability in case of a national security requirement.

Radiological/Nuclear Accident Response: This program ensures the maintenance of the Department's technical and operational capabilities for responding to radiological accidents/incidents or malevolent nuclear incidents worldwide. Radiological/Nuclear Accident Response assets include the Nuclear Emergency Search Team, Federal Radiological Monitoring and Assessment Center, Aerial Measuring System, Atmospheric Release Advisory Capability, Accident Response Group, Radiological Assistance Program, and Radiation Emergency Assistance Center/Training Site.

Tritium Source: This program will support the implementation of the Secretarial Record of Decision, as announced in December 1995, on tritium production and recycle facilities to provide tritium for the Nation's enduring nuclear weapons stockpile.

Materials Surveillance: This program (formerly named Materials Surveillance and Technical Support) funds the storage, handling, shipping, safeguards, control and accountability, and disposition for Defense Programs nuclear materials located at Defense Programs' facilities and former DP facilities (Rocky Flats, Hanford, Fernald, Savannah River, and Idaho National Engineering Laboratory) that have been transferred to Environmental Management.

Defense Asset Acquisition account - Defense Programs - Stockpile Management construction project line items.

FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
WEAPONS STOCKPILE MANAGEMENT
(Dollars in Thousands)

Funding Schedule:

Program Activity	FY 1996	FY 1997	FY 1998	\$ Change	% Change	Request
CORE STOCKPILE MANAGEMENT						
OPERATIONS & MAINTENANCE						
DIRECT MISSION PROGRAM						
WEAPONS PROGRAM	\$ 230,802	\$ 257,300	\$ 255,275	\$ (2,025)	-1%	\$
PRODUCTION SUPPORT	292,803	268,368	296,981	28,613	11%	
MATERIALS RECYCLE AND RECOVERY	37,158	35,555	40,989	5,434	15%	
TRANSPORTATIONS SAFEGUARDS	59,300	66,400	64,700	(1,700)	-3%	
RECONFIGURATION	80,000	25,000	21,000	(4,000)	-16%	
Subtotal, DIRECT MISSION PROGRAM	\$ 700,063	\$ 652,623	\$ 678,945	\$ 26,322	4%	\$
INFRASTRUCTURE PROGRAMS						
ENVIRONMENT, SAFETY AND HEALTH						
Environment	\$ 22,548	\$ 20,656	\$ 16,343	\$ (4,313)	-21%	\$
Waste Management	4,970	5,525	12,628	7,103	129%	
Health and Safety	75,658	72,879	67,423	(5,456)	-7%	
Subtotal, Environment, Safety, and Health	\$ 103,176	\$ 99,060	\$ 96,394	\$ (2,666)	-3%	\$
SAFEGUARDS AND SECURITY	\$ 83,953	\$ 89,102	\$ 88,776	\$ (326)	-0%	\$
UTILITIES, SITE PLANNING AND MAINTENANCE						
Site Planning and Project Management	\$ 54,679	\$ 36,470	\$ 32,378	\$ (4,092)	-11%	\$
Utilities	48,526	46,978	44,637	(2,341)	-5%	
Maintenance	123,970	120,470	115,347	(5,123)	-4%	
Subtotal, Utilities, Planning & Maintenance	\$ 227,175	\$ 203,918	\$ 192,362	\$ (11,556)	-6%	\$
MANAGEMENT AND ADMINISTRATION	\$ 215,781	\$ 223,559	\$ 178,410	\$ (45,149)	-20%	\$
OTHER COSTS	45,238	38,052	32,162	(5,890)	-15%	
Subtotal, INFRASTRUCTURE PROGRAMS	\$ 675,323	\$ 653,691	\$ 588,104	\$ (65,587)	-10%	\$
CAPITAL EQUIPMENT	\$ 24,190	\$ 27,473	\$ 19,450	\$ (8,023)	-29%	\$
GENERAL PLANT PROJECTS	10,000	7,000	8,000	1,000	14%	
TOTAL, CORE MANAGEMENT O&M	\$ 1,409,576	\$ 1,340,787	\$ 1,294,499	\$ (46,288)	(0)	\$
CONSTRUCTION LINE ITEMS	\$ 112,725	\$ 90,536	\$ 0	\$ (90,536)	-100%	\$
TOTAL CORE STOCKPILE MANAGEMENT	\$ 1,522,301	\$ 1,431,323	\$ 1,294,499	\$ (136,824)	-10%	\$ TBD

FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
WEAPONS STOCKPILE MANAGEMENT
(Dollars in Thousands)

Funding Schedule:

<u>Program Activity</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>\$ Change</u>	<u>% Change</u>	<u>Request</u>
ENHANCED SURVEILLANCE <i>OPERATIONS & MAINTENANCE</i>	\$ 18,872	\$ 55,000	\$ 60,000	\$ 5,000	9%	\$ TBD
ADVANCED MANUFACTURING, DESIGN AND PRODUCTION TECHNOLOGIES <i>OPERATIONS & MAINTENANCE</i>	\$ 44,377	\$ 100,763	\$ 103,181	\$ 2,418	2%	\$ TBD
RADIOLOGICAL/NUCLEAR ACCIDENT RESPONSE <i>OPERATIONS & MAINTENANCE</i>	\$ 70,010	\$ 75,800	\$ 79,300	\$ 3,500	5%	\$
<i>CONSTRUCTION LINE ITEMS</i>	\$ 900	\$ 3,825	\$ 0	\$ 0	0%	\$
TOTAL, RAD'L/NUC ACCIDENT RESPONSE	<u>\$ 70,910</u>	<u>\$ 79,625</u>	<u>\$ 79,300</u>	<u>\$ 3,500</u>	<u>4%</u>	<u>\$ TBD</u>
TRITIUM SOURCE <i>OPERATIONS & MAINTENANCE</i>	\$ 75,000	\$ 150,000	\$ 184,485	\$ 34,485	23%	\$ TBD
MATERIALS SURVEILLANCE <i>OPERATIONS & MAINTENANCE</i>	\$ 109,811	\$ 112,120	\$ 107,000	\$ (5,120)	-5%	\$ TBD
Subtotal, WEAPONS STOCKPILE MANAGEMENT	<u>\$ 1,841,271</u>	<u>\$ 1,928,831</u>	<u>\$ 1,828,465</u>	<u>\$ (96,541)</u>	<u>\$ 0</u>	<u>\$ TBD</u>
Adjustment	\$ (124,078)	\$	\$	\$ 0	\$ 0%	\$ TBD
Subtotal, Directed Program	<u>\$ 1,717,193</u>	<u>\$ 1,928,831</u>	<u>\$ 1,828,465</u>	<u>\$ (96,541)</u>	<u>\$ -5%</u>	<u>\$ TBD</u>
Comparability Adjustment	\$ 160,269	\$	\$	\$ 0	\$ 0%	\$ TBD
TOTAL, NEW BUDGET AUTHORITY (Noncomparable)	<u><u>\$ 1,877,462</u></u>	<u><u>\$ 1,928,831</u></u>	<u><u>\$ 1,828,465</u></u>	<u><u>\$ (96,541)</u></u>	<u><u>\$ -5%</u></u>	<u><u>\$ 1,788,000</u></u>

WEAPONS STOCKPILE MANAGEMENT
CAPITAL OPERATING EXPENSES AND CONSTRUCTION SUMMARY
Detail and Crosscut \$ in Thousands

	Prior Years	Fiscal Year				\$ CHG	% CHG
		1996	1997	1998	1999		
OPERATIONS & MAINTENANCE							
Other (Line Item) Project Costs							
Conceptual Design Costs in Excess of \$3 million							
97-D-122, Nuclear Materials Storage Fac. Renovation, LANL	\$ 3,160	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	0%
98-D-122 SMRI-Capability Maint & Improvements Project, LANL		6,380	7,820			(7,820)	-100%
98-D-121 Tritium Supply, Various Locations							
Accelerator Production of Tritium (APT)		62,000	12,000			(12,000)	-100%
"Bridge" Costs in Excess of \$3 million & Other OPC							
1/ OPC, not included above, for FY 1998 Requested Line Items		15,907	88,000	214,485		126,485	144%
Subtotal, Other (Line Item) Project Costs		84,287	107,820	214,485	TBD	106,665	
Capital Equipment							
Capital Equipment - Core Stockpile Management							
Basic Capital Equipment		\$ 18,640	\$ 17,248	\$ 16,850	\$	\$ (398)	-2%
Major Items of Equipment		0	0	0		0	0%
Automated Data Processing Equipment							
Mechanical CAD/CAM CAE Migration, KC		1,250					
Focused Factory Phase 5, KC		1,100					
Upgrade Unclassified GP System, KC		1,200					
FY96 Unclassified Computer Upgrade, PX		2,000					
Unclassified IBM/MVS Data Center Consolidation, Y-12			2,700				
Shop Floor Extension No. 2, PX			2,000				
Manuf/DYMCAS Support Replacement Proc., Y-12				2,600			
DCS Upgrade, 233-H, SR			5,525				
Capital Equipment - Accident Response		8,100	6,437	7,100		663	10%
Capital Equipment - Materials Surveillance		1,000	0	1,000		1,000	100%
Subtotal, Capital Equipment		\$ 33,290	\$ 33,910	\$ 27,550	\$ TBD	\$ (6,360)	-19%
General Plant Projects, Various Locations		\$ 10,000	\$ 7,000	\$ 8,000	\$	\$ 1,000	14%
TOTAL, CAPITAL OPERATING EXPENSES		\$ 127,577	\$ 148,730	\$ 250,035	\$ TBD	\$ 101,305	68%

1/ Operating Project Costs for line items requesting funding in FY 1998 but which do not have a Conceptual Design Report (CDR) that cost in excess of \$3 million and which did not require "bridge" funding (funding between completion of CDR and first year construction authorization) in excess of \$3 million.

Weapons Stockpile Management Core Stockpile Management

The Core Stockpile Management operating program includes procurement of materials (exclusive of nuclear materials); fabrication and assembly of nuclear weapons and weapon components; lifetime surety, maintenance and reliability assessments of the enduring stockpile; weapon dismantlement and disposal; maintenance of a production capability; development and operation of safe, secure systems for transporting nuclear weapons and weapon components; preparation, issuance, and maintenance of field training manuals; and facility startup and standby operations.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Fully support the warhead dismantlement/disposal and storage program
- Increase support for retrofit programs for the B61, W76, B83, W87
- Support the limited life component exchange program
- Provide quality evaluations, special testing, and surveillance of nuclear weapon systems
- Acquire a pit rebuild capability program
- Maintain and improve upon essential technologies and capabilities
- Implement the Enhanced Surveillance Program
- Maintain the weapons complex infrastructure at a level necessary to accomplish mission requirements
- Support the W76 dual revalidation program
- Implement seamless safety for the W76, W78, and W87

SIGNIFICANT CHANGE FROM FY 1997:

The FY 1998 program funding for Core Stockpile Management Operations and Maintenance (O&M) is about \$46 million below the FY 1997 appropriation for O&M. Programmatic increases have been offset by savings from program progression and the nonrecurring payment in FY 1997 of pension plan/sales tax liabilities associated with the Mound and Pinellas Plants (-\$39 million).

This request reflects increases in the following areas:

- (+\$21.4 million) transferred in from the Stockpile Stewardship Program and the Office of Nuclear Energy to support operations of nuclear materials facilities at LANL,
- (+\$ 7.65 million) transferred from EM for a one-year pilot project for the transition of responsibility and funding of newly generated waste back to the generator.

Construction line item funding decreases by \$90.5 million, reflecting the transfer of construction funding in FY 1998 to the Defense Asset Acquisition account.

BUDGET CONTENTS:

- **Weapons Program** includes the direct activities necessary to meet all directive schedules for Stockpile Maintenance, Stockpile Evaluation, and Dismantlement.
- **Production Support** includes quality and production supervision and control, production and process engineering, facility startup and standby, and field engineering.
- **Materials Recycle and Recovery** includes activities associated with recycle and recovery of plutonium, enriched uranium, and tritium.
- **Transportation Safeguards** includes funding for safe, secure movement of nuclear weapons, strategic quantities of Special Nuclear Material, selected nonnuclear weapon components, and limited life components.
- **Nonnuclear Reconfiguration** encompasses the transfer and requalification of 25 technologies and processes from the Mound, Pinellas, and Rocky Flats Plants to the Kansas City Plant, Savannah River Site, LANL, and SNL.
- **Environment, Safety, and Health Programs** maintain compliance with related federal, state and local laws , Executive Orders, and provides for the safety and health of the public and facility employees.

Weapons Stockpile Management - CORE STOCKPILE MANAGEMENT

- **Safeguards and Security** provides for the protection of all classified material, vital facilities, government property and plant personnel.
- **Site Planning, Utilities, and Maintenance** provides for space management, facility planning, energy management and conservation, preventive and corrective maintenance and the procurement of utility services.
- **Management and Administration** provides for those activities associated with general management and administrative functions.
- **Special Projects and Other** includes the conduct of special projects, one-time efforts, or complex-wide efforts for which special control or visibility is required.
- **Capital Equipment and General Plant Projects** for four production plants and three weapons laboratories to maintain the capabilities necessary for stockpile maintenance, stockpile evaluation, and dismantlement activities.
- **Construction Line Items** provide line item funding for infrastructure and programmatic construction projects; beginning in FY 1998, these projects are located in the Defense Asset Acquisition account.

MEASURABLE PERFORMANCE ACTIVITIES (Summary of Program Category Pages):

<u>FY 1996:</u> <ul style="list-style-type: none"> - Fully supported all directive schedules - Supported development, preproduction and prototyping of the new Safeguards Transporter (SGT) - Initiated production activities for the B61-11 program and continued support for the W87 Life Extension Program - Upgraded the B83-1 strategic bomb - Develop/apply Acorn technology to stockpiled weapons - Partially funded the DP pension and sales tax liabilities at the Mound and Pinellas Plants - Initiated the Enhanced Surveillance Program (ESP) - Initiated the W76 dual revalidation program 	<u>FY 1997:</u> <ul style="list-style-type: none"> - Fully support all directive schedules. - Support the production of the new Safeguards Transporter (SGT) - Fund DP pension and sales tax liabilities at the Mound and Pinellas plants - Issue the LANL and Pantex Site-wide EIS - Continue production activities to support the B61-11, B83-1 and W87 Life Extension Program - Continue the W76 dual revalidation program - Initiate a Plant Fellowship Program 	<u>FY 1998:</u> <ul style="list-style-type: none"> - Fully support all directive schedules. - Support the production of the new Safeguards Transporter (SGT) - Continue production activities to support the B61-11, B83-1 and W87 Life Extension Program - Continue the W76 dual revalidation program - Implement the Stockpile Management Restructuring Initiative - Construction funding moved to the Defense Asset Acquisition account.
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FUNDING LEVELS:

\$1,522,301	\$1,431,323	\$1,294,499
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Weapons Stockpile Management - **CORE STOCKPILE MANAGEMENT** - *Direct Mission*

WEAPONS PROGRAM: The Weapons Program includes the direct activities necessary to meet all directive schedules for Stockpile Maintenance, Stockpile Evaluation, and Dismantlement as depicted in the Nuclear Weapons Stockpile Plan. Stockpile Maintenance efforts include limited life component exchange, maintenance, and retrofit activities on various weapon systems in the enduring stockpile. Stockpile Evaluation activities include new material laboratory tests, new material flight tests, stockpile laboratory tests, stockpile flight tests, quality evaluations, special testing, and surveillance of weapon systems. Dismantlement includes all activities for weapons associated with retirement, disassembly, component characterization, and disposal and reclamation of materials and components; the engineering, development, testing, certification, procurement, and refurbishment of containers required for interim storage; and the staging and storage of weapons, components, and materials awaiting dismantlement.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Support stockpile maintenance and limited life component (LLC) exchange activities
- Support of directive schedules for stockpile evaluation activities and retirement-disposal activities
- Support the development, testing certification, procurement, and refurbishing of containers (including AT-400A)
- Support the staging and storage of weapons, components, and materials awaiting dismantlement
- Support the disassembly of canned subassemblies at the Y-12 Plant

CHANGE FROM FY 1997:

The decrease in the FY 1998 maintenance program results from the winding down of B61-11 activities at the Kansas City Plant, which is partially offset by increased reservoir loading at the Savannah River Site and increased nonnuclear component manufacturing at LANL. The increase in Stockpile Evaluation results from increased evaluation activities at the Pantex Plant, and support for the pit rebuild capability at LANL. The slight increase in dismantlement costs from FY 1997 is driven by an increase in disassembly, staging, storage, and container efforts.

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996 :</u></p> <ul style="list-style-type: none"> - Stockpile Maintenance activities: <ul style="list-style-type: none"> - Fully supported directive schedules; major efforts include the B61 ALT 335 & ALT 339, B83 ALT 750, W76 ALT 317 - Continued B61-11 and W87 Life Extension Program - Continued the B83 strategic bomb upgrade program - Stockpile Evaluation activities: <ul style="list-style-type: none"> - Supported activities to develop and demonstrate technologies/capabilities of a pit rebuild program at LANL - Initiated reservoir testing at Savannah River - Dismantlement activities: <ul style="list-style-type: none"> - Dismantled 1,064 warheads at Pantex 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Stockpile Maintenance activities: <ul style="list-style-type: none"> - All directive schedules are fully supported; major efforts include the B61 ALT 335, 336 and 339, B83 ALT 750, W76 ALT 317 - Continue B61-11 and W87 Life Extension Program - Continue to upgrade the B83 strategic bomb - Stockpile Evaluation activities: <ul style="list-style-type: none"> - Continue to support the pit rebuild technology/capability program at LANL - Continue the W76 dual revalidation program - Dismantlement activities: <ul style="list-style-type: none"> - Dismantlement of 944 warheads at Pantex 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Stockpile Maintenance activities: <ul style="list-style-type: none"> - Full support for directive schedules; major efforts include the B61 ALT 335, 336 and 339, B83 ALT 750, W76 ALT 317 - B61-11 activities continue but are winding down - W87 Life Extension Program activities increase - Continue to upgrade the B83 strategic bomb - Stockpile Evaluation activities: <ul style="list-style-type: none"> - Continue to support the pit rebuild technology/capability program at LANL - Continue the W76 dual revalidation program - Dismantlement activities: <ul style="list-style-type: none"> - Dismantlement of approximately 1,300 warheads at Pantex
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FUNDING LEVELS:

\$230,802	\$257,300	\$255,275
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CORE STOCKPILE MANAGEMENT - *Direct Mission* - WEAPONS PROGRAM

Weapons Stockpile Management -**CORE STOCKPILE MANAGEMENT**-*Direct Mission*

PRODUCTION SUPPORT: Production Support activities include quality and production supervision and control, SNL quality assurance activities, production and process engineering, facility startup and standby, and field engineering. Supports the Stockpile Maintenance, Evaluation, Dismantlement, Materials Recycle and Recovery, and Advanced Manufacturing, Design and Production Technologies Programs.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Weapons quality assessment through support for Quality Criteria-1 (QC-1)
- Supports the MODs and ALTs for the B61, W76, B83 and W87 Life Extension Program (LEP)
- Continue support of ACORN for the W87
- Support joint test assembly program
- Provide production engineering, analytical labs, computer support, and quality supervision and control for the Replacement Tritium Facility at the Savannah River Site
- Support development of uranium technologies at LANL
- Support production engineering and Manufacturing Development Engineering (MDE) activities for the stockpile and reconfiguration programs at SNL
- Support the development and prototyping capabilities for production of neutron generators, neutron tubes, thermal batteries and prototyping process characterization
- Develop technologies to produce a complete physics package at LANL

CHANGE FROM FY 1997:

The FY 1998 program increase relates primarily the transfer of programmatic and funding responsibility from Stockpile Stewardship and the Office of Nuclear Energy to support operations of nuclear materials facilities at LANL.

MEASURABLE PERFORMANCE ACTIVITIES:

<u>FY 1996 :</u> <ul style="list-style-type: none">- Support initial procurement of AT-400A container- Support Y-12 Plant's resumption activities- Cease production support activities for the Oxnard facility	<u>FY 1997:</u> <ul style="list-style-type: none">- Continue AT-400A procurement- Support Y-12 Plant's resumption activities- Qualify new transferred technologies at the Kansas City Plant that were not included in the scope of nonnuclear reconfiguration	<u>FY 1998:</u> <ul style="list-style-type: none">- Continue AT-400A procurement- Support Y-12 Plant's resumption activities- Qualify new transferred technologies at the Kansas City Plant that were not included in the scope of nonnuclear reconfiguration- Support operation of nuclear materials facilities at LANL
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FUNDING LEVELS:

\$292,803	\$268,368	\$296,981
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CORE STOCKPILE MANAGEMENT-*Direct Mission*-PRODUCTION SUPPORT

Weapons Stockpile Management -**CORE STOCKPILE MANAGEMENT**-*Direct Mission*

MATERIALS RECYCLE AND RECOVERY: This program includes activities associated with recycle and recovery of plutonium, enriched uranium, and tritium from fabrication and assembly operations, limited life components, and dismantlement of weapons and components. It also involves the process in recycling and purifying the above materials to meet specifications for safe, secure, and environmentally acceptable storage, including meeting the directive schedule for tritium reservoir refills. In addition, this program includes efforts related to the development and implementation of new processes or improvements to existing processes for fabrication and recovery operations for plutonium and uranium, and for material stabilization, conversion, and storage. These activities are largely conducted at the Los Alamos National Laboratory, Savannah River Site, and the Y-12 Plant.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Maintain base necessary for viable operation of TA-55 nuclear facilities
- Continue plutonium stabilization activities in support of DNFSB recommendation 94-1
- Conduct recycle and recovery operations necessary to support development and workload within the safety and regulatory envelope of each facility
- Expand nuclear processing technology base at LANL
- Support stabilization and purification activities for the Pit Rebuild Program and pit fabrication at LANL

CHANGE FROM FY 1997:

The increase over FY 1997 results from the resumption of Enriched Uranium Operations at the Y-12 Plant and an accelerated schedule for responding to Defense Nuclear Facilities Safety Board recommendation 94-1 regarding stabilization of plutonium residues and wastes at LANL.

MEASURABLE PERFORMANCE ACTIVITIES:

<u>FY 1996:</u> - Supported tritium extraction operations of Savannah River targets - Continued safety analysis update requirement, conduct of operations and training to qualify and certify chemical operators to support resumption activities at the Y-12 Plant	<u>FY 1997:</u> - Complete tritium extraction operations of remaining Savannah River targets - Restart and operate chemical recovery processes at the Y-12 Plant - Continue conduct of operations and training for chemical operators	<u>FY 1998:</u> - Maintain base necessary for viable operation of TA-55 nuclear facilities - Support resumption of enriched uranium operations at the Y-12 Plant and ongoing rewriting and generating of new operating procedures, upgrading of Operational Safety Requirements documents and developing and implementing of training programs

FUNDING LEVELS:

\$37,158	\$35,555	\$40,989
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CORE STOCKPILE MANAGEMENT-*Direct Mission*-**MATERIALS RECYCLE & RECOVERY**

Weapons Stockpile Management -**CORE STOCKPILE MANAGEMENT**-*Direct Mission*

TRANSPORTATION SAFEGUARDS: The mission of the Transportation Safeguards Program is to provide safe, secure movement of nuclear weapons, strategic quantities of Special Nuclear Material, selected non-nuclear weapon components, and limited life components to and from military locations and between nuclear complex facilities within the continental United States. Supports the level of weapon deliveries and stockpile modifications specified in the current Production and Planning Directive. Provides operational fleet vehicles and communications systems through repair and refurbishment, and modifications to enhance safety and security. This program element does not include the cost for the couriers and other administrative personnel (Federal Employees) who execute this program. These costs include salaries and benefits, travel, and training, and are funded in the Weapons Activities Program Direction decision unit.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Maintenance of an aggressive vehicle maintenance program for 54 trailers and a communications system
- Support of Department of Defense base closure weapons movement

CHANGE FROM FY 1997:

The change from FY 1997 is reflects an increase in funding for the Safeguards Transporter (SGT) (\$14.3M in FY 1997 to \$16.9M in FY 1998) which is more than offset by reduced refurbishment costs on older Safe Secure Transporters.

MEASURABLE PERFORMANCE ACTIVITIES:

<u>FY 1996 :</u> <ul style="list-style-type: none">- Supported development and provided funding for preproduction and prototyping of the new Safeguards Transporter (SGT).- Supported production of first SGT test vehicle- Handled 580 shipments, covering approximately 4.2 million miles	<u>FY 1997:</u> <ul style="list-style-type: none">- Provides funding for long-lead procurement items such as support structures, trailer frames, and electrical and mechanical components; tooling and gauging and product testers in support of the SGT. Six units will be in the production phase in FY 1997.- Plan to handle 650 shipments covering approximately 5.1 million miles	<u>FY 1998:</u> <ul style="list-style-type: none">- Continues incremental long-lead procurement for the SGT. A total of twelve units will be in the production phase with the first delivery scheduled for December 1997.- Plan to handle 700 shipments covering approximately 6.1 million miles
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FUNDING LEVELS:

\$59,300	\$66,400	\$64,700
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CORE STOCKPILE MANAGEMENT-*Direct Mission*-TRANSPORTATION SAFEGUARDS PROGRAM

Weapons Stockpile Management - **CORE STOCKPILE MANAGEMENT** - *Direct Mission*

NONNUCLEAR RECONFIGURATION supports the transfer and consolidation of 25 activities from the Mound, Pinellas, and Rocky Flats Plants to the Kansas City Plant, Savannah River Site, LANL, and SNL. This includes the transfer and the requalification of 25 technologies and processes at the various receiver sites. This program, as currently scoped, is planned to conclude in FY 2001. However, the Department is reviewing the infrastructure requirements to support the President's "Lead" and "Hedge" strategy relative to START I and START II force structures which could increase the scope of this effort to meet capacity requirements at Sandia National Laboratory and the Kansas City Plant..

PROGRAM GOALS/ONGOING ACTIVITIES:

- Modify or upgrade existing facilities at the Receiver Sites, transfer or procure capital equipment for the Receiver Sites, requalify activities at the Receiver Sites
- Supports the transfer of remaining activities and the requalification of production capability at the receiver sites.

CHANGE FROM FY 1997:

FY 1998 program decrease is due to program progression and the completion of the majority of the transfer activities required to reconfigure the weapons complex.

MEASURABLE PERFORMANCE ACTIVITIES:

<u>FY 1996 :</u> - Completed construction for optoelectronics, safe secure trailers, neutron detector, transducers, support pads, and nuclear grade steels at KCP; neutron generators and thermal batteries at SNL. - Completed requalification activities for lightning arrestor connectors at KCP, and miliwatt generator heat sources at SNL. - Initiated requalification for flat cables at KCP and thermal batteries at SNL.	<u>FY 1997:</u> - Support the transfer of remaining activities and the requalification of production capability at the receiver sites. - Complete construction activities for flat cables, roundwire detonators at KCP; beryllium technology and pit support at LANL; and reservoir surveillance and gas transfer systems at SR. - Complete requalification activities for support pads, neutron detectors, and nonnuclear Acorn at KCP, and neutron generators at LANL.	<u>FY 1998 :</u> - Support the transfer of remaining activities and the requalification of production capability at the receiver sites. - Initiate requalification for beryllium technology and Pit Support at LANL. - Complete construction activities for high power detonators at LANL. - Complete requalification activities for the production of safe secure trailers, a function transferred from the Rocky Flats Plant and transducers at KCP, and gas transfer at SR.

FUNDING LEVELS:

\$80,000	\$25,000	\$21,000
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CORE STOCKPILE MANAGEMENT-*Direct Mission*-RECONFIGURATION PROGRAM

Weapons Stockpile Management - **CORE STOCKPILE MANAGEMENT**--*Infrastructure*

ENVIRONMENT, SAFETY, AND HEALTH PROGRAMS: The Environment Program consists of implementing and maintaining a base program to support compliance with environmental laws, such as federal, state and local laws, and DOE Orders. The Waste Management Program maintains compliance with related federal, state, and local laws, and DOE Orders, and includes waste management activities at the weapons facilities not specifically provided for in the Environmental Restoration/Waste Management Five Year Plan. The Safety and Health Program supports activities directed to the protection of the safety and health of the public and employees, as required by federal, state, regional and local law or regulation, Executive Orders, and DOE Orders.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Protection of air and water quality by complying with the Clean Air, Clean Water, and the Safe Drinking Water Acts
- Carry on a safety program that includes fire protection engineering, industrial safety, nuclear safety, risk management, configuration management, and administration
- Perform analysis for waste stream characterizations and support for recycling programs
- Operation of Burning Grounds (Pantex Plant)
- Control of solid and hazardous waste generation
- Compliance with the Comprehensive Environmental Response and Compensation, and Liability Act (CERCLA); and the Resource Conservation and Recovery Act (RCRA) of 1976
- Support of site-wide Environmental Impact Statements (EIS)
- Characterization, certification, and packaging of waste; bagging and removing of radioactive waste; certifying, labeling, and shipping of waste
- Waste Minimization, Pollution Prevention, and management and disposal of sanitary waste
- Ensure compliance with applicable laws and regulations (OSHA, DOE Orders, etc.)
- Ensure the safety and health of the public and of facility employees
- Ensure a health program that encompasses, industrial hygiene, radiological protection, occupational medicine, and administration
- Provide emergency preparedness activities and fire protection at the sites
- Maintain industrial hygiene, industrial safety, occupational medical services, radiological protection programs
- Provide nuclear safety and transportation support function

CHANGE FROM FY 1997:

The reduced program for FY 1998 reflects the completion of the site-wide EIS at Pantex during FY 1997, this is partly offset by the one-year pilot project to transfer management of newly generated waste back to the generator from EM.

MEASURABLE PERFORMANCE ACTIVITIES:

<u>FY 1996:</u> - Environment Program - Waste Management Program - Safety and Health Program - Increase criticality safety/radiation protection activities at Y-12 for resumption of operations	<u>FY 1997:</u> - Environment Program - Waste Management Program - Safety and Health Program - Continue criticality safety/radiation protection activities at Y-12 for resumption of operations	<u>FY 1998:</u> - Environment Program - Waste Management Program - Safety and Health Program
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FUNDING LEVELS:

\$103,176	\$99,060	\$96,394
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Weapons Stockpile Management -**CORE STOCKPILE MANAGEMENT**-*Infrastructure*

SAFEGUARDS AND SECURITY: The Safeguards and Security Program assures protection of all classified material, vital facilities, government property and plant personnel; to provide and operate the protective force program; and to administer the Nuclear Material Control and Accountability Program. Detailed below are continuing measurable performance activities.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Maintain and operate a protective force program
- Provide adequate levels of security education for employees
- Administer the Personnel Security Assistance Program
- Design, operate, and support site physical security systems
- Administer technical surveillance countermeasures and TEMPEST programs
- Support DOE declassification initiative
- Ensure accountability of Special Nuclear Material and other nuclear material
- Support DOE declassification and "common badge" initiative
- Support the review of DP initiatives to assure appropriate safeguards and security is considered in design and implementation
- Provide Material Access Area (MAA) physical security

CHANGE FROM FY 1997:

The change from FY 1997 reflects the transfer of programmatic and funding responsibility from Stockpile Stewardship to support operation of nuclear materials facilities at LANL. This increase is partially offset by a continued reduction of Q-cleared personnel and a reduction in armed protective force personnel.

MEASURABLE PERFORMANCE ACTIVITIES:

<u>FY 1996:</u> All activities are covered in the Ongoing Activities section.	<u>FY 1997:</u> All activities are covered in the Ongoing Activities section.	<u>FY 1998:</u> All activities are covered in the Ongoing Activities section.
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FUNDING LEVELS:

\$83,953	\$89,102	\$88,776
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CORE STOCKPILE MANAGEMENT-*Infrastructure*-SAFEGUARDS & SECURITY

Weapons Stockpile Management - **CORE STOCKPILE MANAGEMENT-Infrastructure**

SITE PLANNING, UTILITIES, and MAINTENANCE: The Site Planning Program provides space management and facility planning with focus on DOE's initiative consolidation and downsizing of the weapons complex, administers the energy management program in support of energy conservation, and provides support for facility engineering services. The Maintenance Program provides preventive, corrective, and emergency maintenance of facilities and associated equipment. The Utilities Program supports the procurement of utility services, the facility operation, and maintenance for utility consumption at all sites.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Provide comprehensive Site Planning
- Administer the energy management program to meet the DOE goal of 30% reduction of energy consumption by FY 2005
- Prepare Conceptual Design Reports, construction project data sheets, and cost estimates
- Develop design criteria for general project planning, tracking, reporting, and management
- Support planning for consolidation and downsizing of the weapons complex
- Perform plant engineering services
- Provide technical engineering support for critical safety systems and configuration control of components and subsystems
- Provide corrective and preventative maintenance services
- Provide support for downsizing efforts
- Begin effort to minimize on-site materials needed for maintenance
- Incorporate more predictive maintenance techniques in day-to-day operations
- Execute preventive maintenance on all site systems and equipment and repair of all failing or malfunctioning systems and equipment
- Administer and manage GSA contract and provide preventive and corrective maintenance on over 350 vehicles (Pantex)
- Procure utility services at all sites and manage utility operation and resources associated with utility systems
- Develop, maintain and prepare to implement utility plans to meet future load requirements

CHANGE FROM FY 1997:

The change from FY 1997 results from the completion of most planning and pre-Title I efforts related to the Stockpile Management Restructuring Initiative in FY 1997 and the transition to implementation through the construction project.

MEASURABLE PERFORMANCE ACTIVITIES:

<u>FY 1996 :</u> <ul style="list-style-type: none">- Site Planning- Utilities- Maintenance	<u>FY 1997:</u> <ul style="list-style-type: none">- Site Planning- Utilities- Maintenance	<u>FY 1998:</u> <ul style="list-style-type: none">- Site Planning- Utilities- Maintenance
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FUNDING LEVELS:

\$227,175	\$203,918	\$192,362
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CORE STOCKPILE MANAGEMENT-Infrastructure-SITE PLANNING, UTILITIES AND MAINTENANCE

Weapons Stockpile Management -**CORE STOCKPILE MANAGEMENT**-*Infrastructure*

MANAGEMENT AND ADMINISTRATION: The Management and Administration Program provides for those activities associated with general management and administrative functions which include: information outreach, information services, taxes, human resources, chief financial officer, procurement, legal support, logistic support, administrative support, quality assurance, management fees, executive direction, and laboratory directed research and development.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Maintain appropriate program in human resources
- Maintain a public relations, information outreach program
- Provide computer services, telecommunications, general purchasing and transportation services
- Provide financial services (including taxes)
- Maintain training program
- Support legal staff, site management, operational surety and quality programs, and award fees
- Provide support to the Laboratory Directed R&D activities

CHANGE FROM FY 1997:

FY 1998 program decrease is driven by the nonrecurring payment of pension plans/sales tax liabilities at Mound and Pinellas in FY 1997. This decrease is partially offset by the FY 1998 funding requirement for the National Resource Center for Plutonium in Amarillo, Texas to be provided by Defense Programs.

MEASURABLE PERFORMANCE ACTIVITIES:

<u>FY 1996 :</u> - Provide initial payment on DP pension fund liability/sales tax at Mound and Pinellas - Enhanced capabilities for Energy System Task Based Management System	<u>FY 1997:</u> - Provide incremental payment on DP pension fund liability at Mound and Pinellas - Provide one-half of the funding for the National Resource Center for Plutonium in Amarillo, Texas	<u>FY 1998:</u> - Provide full funding for the National Resource Center for Plutonium in Amarillo, Texas
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FUNDING LEVELS:

\$215,781	\$223,559	\$178,410
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CORE STOCKPILE MANAGEMENT-*Infrastructure*-MANAGEMENT & ADMINISTRATION

Weapons Stockpile Management -**CORE STOCKPILE MANAGEMENT-Infrastructure**

SPECIAL PROJECTS AND OTHER: Includes funding for the Albuquerque, Oak Ridge, and Savannah River Operations Offices and Headquarters for the conduct of special projects, one-time efforts or complex-wide efforts that do not fit easily into other budget categories and for which special control or visibility is required. Items at the Albuquerque Operations Office include support for aviation services, radiation effects research, support for environmental impact statements, and other complex-wide efforts. Funding at the Oak Ridge Operations Office provides contractual support for resumption activities at the Y-12 Plant. Funding at the Savannah River Operations Office includes support for Safeguards and Security Costs for the Tritium area at the Savannah River Site and for other activities that provide direct programmatic support.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Supports various special projects including direct programmatic technical contractual support (Aviation Services, Programmatic and Site-wide EISs, container safety, radiation effects, weapons/components shipping, etc.) at the Albuquerque Operations Office.
- Provides short-term technical contractual support of Y-12 resumption activities at the Oak Ridge Operations Office.
- Supports the contract with Wackenhut Services, Incorporated to provide safeguards and security for the Tritium Area at the Savannah River Site. Supports other direct programmatic contractual support.
- Supports various special projects (assessments, analyses, field support/reviews, etc.) at headquarters.

CHANGE FROM FY 1997:

FY 1998 program decrease for the Special Projects and Other Program is driven by the reduced requirement for technical contractual services at the Albuquerque Operations Office and the nonrecurring efforts conducted in FY 1997 at the Idaho National Engineering Laboratory.

MEASURABLE PERFORMANCE ACTIVITIES:

<u>FY 1996:</u> <ul style="list-style-type: none">- Albuquerque Operations Office- Oak Ridge Operations Office- Savannah River Operations Office- Supported special projects at Headquarters including a Uranium Vulnerability Assessment at the Y-12 Plant to be managed by the Office of Environment, Safety and Health.	<u>FY 1997:</u> <ul style="list-style-type: none">- Albuquerque Operations Office- Oak Ridge Operations Office- Savannah River Operations Office- Headquarters- Supports various special projects at Idaho National Engineering Laboratory consistent with FY 1997 Congressional direction: LANL Waste Stream Process Improvements, transportation cask certification and shipping container investigation, nuclear criticality safety benchmark evaluation, and a Special Nuclear Material Shipment Study.	<u>FY 1998:</u> <ul style="list-style-type: none">- Albuquerque Operations Office- Oak Ridge Operations Office- Savannah River Operations Office- Headquarters
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FUNDING LEVELS:

\$45,238	\$38,052	\$32,162
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CORE STOCKPILE MANAGEMENT-Infrastructure-SPECIAL PROJECTS AND OTHER

Weapons Stockpile Management - **CORE STOCKPILE MANAGEMENT**-*Capital Equipment and General Plant Projects*

CAPITAL EQUIPMENT is required by the four production plants and three weapons laboratories to maintain the capabilities necessary for stockpile maintenance, stockpile evaluation, and dismantlement activities.

CHANGE FROM FY 1997:

The decrease from FY 1997 is reflective of the Congressional add-on in FY 1997 for MIE DCS Upgrade, 233-H, Savannah River Site.

FUNDING LEVELS:

FY 1996	FY 1997	FY 1998
\$24,190	\$27,473	\$19,450

GENERAL PLANT PROJECTS provide funding for low cost construction projects (less than \$2 million) required to maintain the infrastructure and ongoing Stockpile Management programs of the four production plants and the three weapons laboratories.

FUNDING LEVELS:

FY 1996	FY 1997	FY 1998
\$10,000	\$7,000	\$8,000

CONSTRUCTION LINE ITEMS:

The Weapons Activities budget justification will only address Operations & Maintenance. Construction activities will be discussed in the Defense Asset Acquisition account. FY 1996 and FY 1997 funding levels include funding for construction activities appropriated under Weapons Activities-Core Stockpile Management.

CHANGE FROM FY 1997:

The change from FY 1997 reflects a budget structure change moving all funding for construction activities into the Defense Asset Acquisition account. Detailed information on construction line items can be found in the Construction Data Sheets following the Stockpile Management budget narrative.

FUNDING LEVELS:

FY 1996	FY 1997	FY 1998
\$ 112,725	\$ 90,536	\$ 0

CORE STOCKPILE MANAGEMENT-*Capital Equipment, General Plant Projects and Construction*

Weapons Stockpile Management Enhanced Surveillance

The Enhanced Surveillance Program is a complex-wide initiative developing predictive measures to address the maintenance needs of the stockpile. The basic goals of the enhanced surveillance program are to predict defects that might occur in the enduring stockpile due to aging or other reasons, to develop a means to assess safety and reliability impacts, and to ensure problems are corrected before they reduce safety or reliability. Enhanced surveillance techniques will extend capabilities to predict the effects of materials aging on components and weapons performance, to determine which components are liable to fail, to estimate failure dates, and to support the establishment of a proactive stockpile life extension program. The Enhanced Surveillance Program will build upon existing Defense Programs' research and development, testing (nonnuclear), and stockpile evaluations/surveillance activities and will develop new predictive models, new techniques for data analysis, and may eventually lead to in- situ, real-time, non-destructive monitoring for warheads. There is an Enhanced Surveillance Program Plan which provides details of this initiative.

PROGRAM GOALS/ONGOING ACTIVITIES:

- To develop advanced predictive model capabilities supporting weapons program management and stockpile life extension by FY 2000.
- To develop new aging focused tools and techniques for incorporation into the core stockpile evaluation/surveillance program.

CHANGE FROM FY 1997:

FY 1998 funding supports the program plan objectives with the validation of models.

MEASURABLE PERFORMANCE ACTIVITIES:

FY 1996 : <ul style="list-style-type: none"> - Program new start - Chartered steering committee and established management structure - Initiated feasibility studies for advanced diagnostics of materials and components - Developed priority list for component/subsystem aging models - Conducted laboratory test of existing stockpile components /materials to develop a materials aging model as an analytical design tool for future weapon performance prediction - Developed non-destructive test capability to bridge the destructive lab test to a non-destructive evaluation 	FY 1997: <ul style="list-style-type: none"> - Develop methods to be used in fabricating diagnostic prototypes - Complete initial set of material models and begin experiments for validation - Begin development of age aware firing system and surety system models - Complete micro-structure assessments of high explosives in the stockpile - Define initial integrated sensor package for in-situ monitoring - Establish an enhanced flight test program to improve confidence in nuclear package delivery and flight performance 	FY 1998: <ul style="list-style-type: none"> - Continue development of methods to be used in fabricating diagnostic prototypes - Continue material modeling and experiments for validation - Continue development of age aware firing system and surety system models - Continue definition of integrated sensor packages for in-situ monitoring - Continue flight test program to improve confidence in nuclear package delivery and flight performance - Begin validation of age aware models
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FUNDING LEVELS:

\$18,872	\$55,000	\$60,000
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ENHANCED SURVEILLANCE

Weapons Stockpile Management Advanced Manufacturing, Design and Production Technologies

The Advanced Manufacturing, Design and Production Technologies Initiative provides the nuclear weapons complex with advanced capabilities for: (1) designing, developing, and certifying components and systems; and (2) producing, assembling, and delivering the components and systems products. By infusing new product and process technologies, and adopting modern business and engineering practices, ADaPT radically changes how DOE designs and builds (“remanufactures”) weapons systems. The ADaPT Initiative has four elements: the Enterprise Integration Program (EIP), the Integrated Product and Process Design/Agile Manufacturing Program (IPPD/AMP), the Process Development Program (PDP), and the Hedge Strategies Program (HSP). Funding for the initiative is allocated primarily to the Department’s weapons production facilities: Pantex, Kansas City, Y-12, and Savannah River Sites, and the weapons laboratories: Los Alamos, Lawrence Livermore, and Sandia National Laboratories. There is an ADaPT master plan which provides details of the Initiative. In addition, there are execution plans for each of the Initiatives' four elements.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Enable seamless, secure information exchanges throughout the DOE nuclear weapons production complex. (EIP)
- Archive the NWC knowledge base with information tools that provide rapid access and guarantee data integrity. (EIP)
- Develop streamlined business and engineering practices and methods for greater responsiveness and productivity. (EIP)
- Develop an “enterprise model” that accurately portrays the operations of the production Complex and can be used to plan and optimize “factory performance.” (EIP)
- Develop, validate, and deploy the tools and technologies needed for Integrated Product and Process Design and Agile Manufacturing systems. (IPPD/AMP)
- Provide the technologies and processes to facilitate rapid design, development, and manufacture of weapons’ replacement hardware for the Stockpile Life Extension Program (SLEP). (EIP)
- Reduce weapon components design and review time, improve design quality, and provide better evaluation and selection of manufacturing processes and parts to assure product reliability. (IPPD/AMP)
- Develop new computerized design tools to integrate designs, and model the performance and manufacture of parts and systems. (IPPD/AMP)
- Develop new processes that will meet constantly changing environmental requirements. (PDP)
- Develop hedge strategies for increased production rates of nuclear and nonnuclear components and demonstrate modular, extensible enabling technologies to facilitate their implementation. (HSP)

CHANGE FROM FY 1997:

The FY 1998 program is at essentially the same level of effort as FY 1997.

Weapons Activities - **ADVANCED MANUFACTURING, DESIGN AND PRODUCTION TECHNOLOGIES (CONTINUED)**

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996:</u> Process Development Program: - Maintained competency in key technologies, manufacturing process and plant operations: - high power detonator development - pit support and tube loading at LANL - development for W76 ACORN, Terrazzo reclamation and Kyle reservoir loading at SR - AT400A development task consisting of welding, vacuum system optimization for automated lines, robotics system, and automated workstations (PX) - Capability maintenance in HE synthesis, formulation, machining, and pressing, analytical evaluation techniques, mechanical properties, evaluation techniques, and test fire techniques (PX)</p>	<p><u>FY 1997:</u> Enterprise Integration Program projects follow: - Develop NWC Multimedia Production Procedures - Develop requirements for NWC Classified Connectivity - Produce a Laser Cutting Workstation - Enterprise modeling study at INEL (\$800K) Integrated Product and Process Design/Agile Manufacturing Program projects include: - Product Realization Information System - Tools for Model-based Design and Manufacturing Process Development Program (PDP) projects include materials research and the development of technologies to meet constantly changing environmental requirements.</p>	<p><u>FY 1998:</u> Enterprise Integration Program projects follow: - Implement NWC Multimedia Production Procedures - NWC Classified Connectivity - Installation of a Laser Cutting Workstation for application at the Y-12 Plant Integrated Product and Process Design/Agile Manufacturing Program projects include: - Product Realization Information System - Tools for Model-based Design and Manufacturing Process Development Program (PDP) projects include materials research and the development of technologies to meet constantly changing environmental requirements.</p>
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FUNDING LEVELS:

\$44,377	\$100,763	\$103,181
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Weapons Stockpile Management Radiological\Nuclear Accident Response Program

The Radiological\Nuclear Accident Program provides the capability to immediately respond to radiological accidents/incidents worldwide. The funding for this Program is allocated to fifteen nation-wide Department locations with the Nevada and Albuquerque Operations Offices, and the Los Alamos, Lawrence Livermore, and Sandia National Laboratories receiving the majority of the funding.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Ensure the maintenance of DOE's technical and operational capabilities for responding to radiological accidents/incidents worldwide
- Monitor environmental impacts of radiation at major DOE and other Federal agency facilities
- Support DOE's resolution of accidents and significant incidents worldwide involving nuclear weapons in DOE and DoD custody
- Support DOE's lead role for establishing and managing the FRMAC
- Support the operations, exercise, and maintenance of associates who provide technical assistance in responding to a threat by an individual or group to detonate a nuclear explosive or scatter nuclear material
- Provide for DOE's first responder assistance for initially addressing an accident or incident involving radiological materials
- Provide DOE's medical and health physics support to radiological accidents and incidents resolution

PROGRAM ASSETS/FUNCTIONS:

- 1) Aerial Measuring System (AMS) is an aerial detection system capable of measuring gamma radiation for locating and tracking airborne radiation.
- 2) Atmospheric Release Advisory Capability (ARAC) provides rapid predictions and projections of the dosage and amount of radionuclides potentially transported, diffused and/or deposited into the atmosphere and the resulting impact on people and the environment.
- 3) Accident Response Group (ARG) is responsible for the resolution of accidents or significant incidents involving U.S. nuclear weapons.
- 4) Federal Radiological Monitoring and Assessment Center (FRMAC) provides the lead federal agency, the State, Tribal and local authorities which are involved in resolving a radiological incident with a single source of compiled and quality controlled radiological monitoring and assessment data.
- 5) Nuclear Emergency Search Team (NEST) provides the U.S. Government's technical response to an act of nuclear terrorism.
- 6) Radiological Assistance Program (RAP) provides a local capability and first response to request for assistance during a radiological accident or incident.
- 7) Radiation Emergency Assistance Center/Training Site (REAC/TS) provides medical advice, specialized training, and on-site assistance, in the treatment of all types of radiation exposure accidents.

CHANGE FROM FY 1997:

FY 1998 program increase is due to the Office of Emergency Response activities to plan, conduct, and participate in the FY 1998, Interagency, full-field Nuclear Incident Response Exercise, and to conduct validation of operational readiness by participating in two interagency overseas deployment exercises.

Weapons Stockpile Management - **RADIOLOGICAL/NUCLEAR ACCIDENT RESPONSE**

MEASURABLE PERFORMANCE ACTIVITIES:

<p>FY 1996: FRMAC:</p> <ul style="list-style-type: none"> -Participated in National Radiological Emergency Planners and Counsel of Radiological Control Program Directors conferences and conducted a regional workshop for Arkansas Nuclear One to provide FRMAC orientation of Federal, State, and Tribal authorities. - Participated in the Pantex exercise, the Minot ARG exercise, and two reactor accident ingestion pathway exercises. - Participated in Exercise Handshake II at the Savannah River Site and provided FRMAC orientation. 	<p>FY 1997: FRMAC</p> <ul style="list-style-type: none"> -Work with the Council of Radiological Control Program Directors and National Radiological Emergency Planners to coordinate FRMAC planning and operational activities on a national level. Also identify and coordinate with Tribal agencies through a national forum. - Participation in 3 reactor accident Ingestion Pathway Exercises with DOE Region assistance and conduct one no-notice readiness deployment. -Complete planning, training, and drill activities in support of the Cassini space launch. 	<p>FY 1998: FRMAC:</p> <ul style="list-style-type: none"> -Implement FRMAC personnel qualification training program. -Support the Cassini space launch. -Participate in the NEST full field exercise. - A full scale training drill (Handshake Three) will be planned with RAP for FY99.
<p>AMS:</p> <ul style="list-style-type: none"> - Completed fabrication of the large high purity germanium (HPGe) detector array, and a ground-based radiation mapping system. - Conducted 4 radiological surveys, 2 multi-spectral surveys, and 9 photo missions. 	<p>AMS:</p> <ul style="list-style-type: none"> -Perform 3 photographic, 2 Multi-Spectral Surveys, four radiation surveys, and a ground-based in situ survey and provide survey reports. -Initiate studies to enhance the capability of the cloud tracking and air sampling aircraft. 	<p>AMS:</p> <ul style="list-style-type: none"> -Perform 5 Multi-Spectral Surveys and provide survey reports. -Continue improvement to instrumentation and assessment techniques.
<p>ARAC:</p> <ul style="list-style-type: none"> - Design/implementation of ARAC III system. - Responded to 8 requests for ARAC support for actual emergencies and went on in-house alert for an additional 10 real events. - Provided ARAC support for a total of 9 major exercises, 43 site exercises. 	<p>ARAC:</p> <ul style="list-style-type: none"> -Continue Emergency Preparedness & Response services for DOE, DoD and other federal agencies. - Continue ARAC III system development. 	<p>ARAC:</p> <ul style="list-style-type: none"> -Continue to support, maintain and evolve Site Workstation capabilities including site drills and training. -Continue ARAC III system development for automated access to all key databases and for prognostic model control.
<p>REAC/TS:</p> <ul style="list-style-type: none"> - Provided 12 on-site and 2 Offsite training courses, training 310 medical and health physics professionals. - Responded to 52 calls for medical radiological assistance involving a total of 103 persons. Admitted 13 persons to REAC/TS for treatment, performed 23 cytogenetic dose estimates, and advised regarding administration of chelating agent (DTPA) 3 times. 	<p>REAC/TS:</p> <ul style="list-style-type: none"> -Provide a capability to provide 24-hour response for medical management of radiation accidents comprised of physicians, nurses, EMT-paramedic, health physicist, radiobiologist, and the support personnel for deployment worldwide. - Continue working with personnel at Hospital 6 in Moscow regarding retrieval of medical data on the acute radiation syndrome. 	<p>REAC/TS:</p> <ul style="list-style-type: none"> -Maintain capability to conduct training in radiation accident management for physicians, nurses, health physicists, and others. -Maintain training of physicians, nurses, and health physicists for radiation accident management.

Weapons Stockpile Management - **RADIOLOGICAL/NUCLEAR ACCIDENT RESPONSE**

<p><u>FY 1996:</u> NEST: - Conducted 3 interagency nuclear emergency response exercises to simulate CONUS locations. Exercises realistically simulated technical and advisory responses in nuclear Weapon of Mass Destruction scenarios. - Provided readiness capabilities for the 1996 Summer Olympic Games and for the Democratic National Convention. - Conducted technical working point drill to improve response to Weapons of Mass Destruction.</p>	<p><u>FY 1997:</u> NEST: - Provide response posture for the 1997 Inauguration and conduct drills and training with other Federal Agencies to simulate response to incidents involving nuclear Weapons of Mass Destruction. -Conduct an interagency command post exercise to validate national level response to nuclear Weapon of Mass Destruction incidents. -Participate in an interagency exercise to evaluate technical responses to nuclear Weapon of Mass Destruction terrorist events. -Conduct a command post exercise in preparation for the full field exercise in FY98.</p>	<p><u>FY 1998:</u> NEST: -Participate in a full field interagency nuclear incident exercise conducted by the FBI to evaluate and validate the National capability to respond to the threat of an improvised nuclear device or weapon of mass destruction. -Conduct command post exercises to train and evaluate the NEST response capability. - Continue developing and validation of technologies to render safe nuclear Weapons of Mass Destruction.</p>
<p>RAP: - Participated in 5 major drills and exercises to evaluate and validate the first responder capability to a radiological or nuclear emergency or accident. - Responded to 10 Radiological Assistance Program emergency response callouts. - Supported Transportation Safeguards Division activities at Ft. Chaffee, Arkansas.</p>	<p>RAP: -Perform Emergency Deployment Readiness Evaluation for all RAP regions. -Provide continued support for the Cassini space mission. -Upgrade and replace existing ground monitoring equipment and mobile laboratories.</p>	<p>RAP: - Maintain resources and capabilities to plan, prepare, and provide first response to radiological accidents and incidents. -Participate in drills and exercises with other Federal, state, tribal, and local emergency response agencies.</p>
<p>ARG: -Conducted a DoD sponsored U.S. Nuclear weapons accident exercise in Minot, North Dakota. -Conducted a DOE internal No-notice call out exercise as part of the Emergency Deployment Readiness Evaluation. -Planned for DOE custody nuclear weapon accident exercises.</p>	<p>ARG: -Complete planning and participate in exercise Digit Pace, an interagency U.S. Nuclear weapons accident exercise with DOE as Lead Federal Agency. -Plan for a National level, JCS-sponsored OCONUS command post exercise scheduled for FY98. -Conduct a Mobility & Training Exercise involving weapon recovery personnel for the Navy and Air Force.</p>	<p>ARG: -Plan and participate in a National level, JCS-sponsored OCONUS command post exercise. -Plan for a National level, JCS-sponsored OCONUS full-field exercise, scheduled for FY99.</p>
FUNDING LEVELS:		
\$70,010	\$75,800	\$79,300

Weapons Stockpile Management Tritium Source

The Tritium Source Program will assure that adequate supplies of tritium will be available to meet the requirements of the enduring stockpile. In keeping with the Secretarial Record of Decision announced on December 5, 1995, the Department will pursue a dual-track strategy for a new, assured source of tritium. One track will explore the purchase of an operating or partially complete commercial light-water reactor (CLWR) or the purchase of irradiation services from such a reactor. The second track will be to design, build, and test critical components of an accelerator system for production of tritium and prepare a design for the actual facility. The Department will select one of the technology alternatives in late 1998 to serve as the primary source of tritium for the nuclear weapons stockpile. The other technology, if feasible, would be developed as a back-up source. The Department's Savannah River Site has been selected for CLWR's Tritium Extraction Facility, which will be constructed regardless of the late 1998 technology decision, and as the location for the accelerator plant, should one be built.

The CLWR project is planning in-reactor (Lead Test Assembly) activities in FY 1998. The Department may be able to pay the host utility for some or all of these services from its current uranium inventory. If the uranium payment method is viable, appropriate legislative authority will be requested from Congress. Within the next few months negotiations with a host utility will be completed. This will determine the contractual arrangements associated with in-reactor testing and better information will be available from which to base a decision regarding the use of uranium for payment.

Secretary O'Leary directed that the Fast Flux Test Facility (FFTF), an experimental reactor at Hanford, Washington, be maintained in "hot standby" instead of being decommissioned as planned, until the Department selects the primary source of tritium. Also at that time a determination will be made about what role, if any, the FFTF could potentially play in meeting future tritium production requirements. FY 1998 funding for FFTF is included in the Office of Environmental Management's budget request.

Two tritium source construction projects are included in the Defense Asset Acquisition account. The FY 1998 scope of the projects include fully funding the Titles I & II design of the CLWR Tritium Extraction Facility (\$39.5million) and fully funding the Title I design of the Accelerator Production of Tritium (APT) plant (\$168.6million). Detailed data sheets are included in the Defense Asset Acquisition account section of the budget.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Implement Record of Decision for dual-track strategic through 1998
- Make a tritium source technology decision in late 1998
- Acquire an assured source of tritium

CHANGE FROM FY 1997:

The increase is for the following CLWR activities: begin irradiation of lead test assemblies in an operating reactor, complete destructive examination of, and tritium extraction from, previously irradiated rods, complete Environmental Impact Statements for the Tritium Extraction Facility, and complete plans, certifications, and arrangements for transporting irradiated Lead Test Assemblies to post-irradiation examination laboratory facilities in 1999. The APT operating funds requested remain relatively unchanged for FY 1997 and continues engineering development and demonstration for accelerator technology. These activities are essential for the late 1998 Secretarial decision on the primary tritium production technology to be used to provide an assured source of tritium in accordance with nuclear weapons stockpile requirements.

Weapons Stockpile Management - **TRITIUM SOURCE**

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996 :</u></p> <ul style="list-style-type: none"> - The Secretary issued a Record of Decision (ROD) for Tritium Supply & Recycling Programmatic Environmental Impact Statement on December 5, 1995, which announced the Department's plan to pursue a dual-track strategy to insure that an adequate tritium supply exists for the nation. - Established a Project Office to implement the Secretarial ROD. (Funded within Weapons Program Direction) <p><u>APT Project</u> (\$62million)</p> <ul style="list-style-type: none"> - Began Engineering, Development & Demonstration activities. - Began the Conceptual Design of the APT plant. - Began and completed Los Alamos National Laboratory (LANL) site-specific National Environmental Policy Act (NEPA) activities. - Began Savannah River Site (SRS) site-specific NEPA activities. - Selected a prime contractor, Burns and Roe Enterprises Inc. of Oradell, N.J. to perform demonstration activities at LANL and design an APT plant for the SRS. <p><u>CLWR Project</u> (\$13million)</p> <ul style="list-style-type: none"> - Began CLWR project pursuing activities within these major task areas: Target Development, Tritium Extraction capability and Reactor(s) Acquisition/Irradiation Services. - Awarded several contracts for Lead Test Assemblies activities. 	<p><u>FY 1997:</u></p> <p><u>APT Project</u> (\$122.5million)</p> <ul style="list-style-type: none"> - Continue Engineering, Development & Demonstration activities. - Complete and issue the Conceptual Design of the plant June, 1997. - Continue Savannah River Site (SRS) site-specific National Environmental Policy Act activities. <p><u>CLWR Project</u> (\$27.5million)</p> <ul style="list-style-type: none"> - Receive and evaluate proposals for conditional selection of reactor(s) for purchase and/or to provide irradiation services. - Complete the conceptual design for the Tritium Extraction Facility, to be located at SRS. - Within Target Development Program, insert Lead Test Assemblies in an operating reactor. 	<p><u>FY 1998:</u></p> <p><u>APT Project</u> (\$132.1million)</p> <ul style="list-style-type: none"> - Continue Engineering, Development & Demonstration activities. - Complete Savannah River Site site-specific National Environmental Policy Act activities. - Complete documentation to support the Department's primary path decision. - Begin Preliminary Design of the APT Plant. (project funding is in the Defense Asset Acquisition account) <p><u>CLWR Project</u> (\$52.4million)</p> <ul style="list-style-type: none"> - Make conditional selections of reactor(s) and award options contracts preparatory to the purchase of a reactor and/or irradiation services. - Submit the Tritium-producing Burnable Absorber Rod Topical Report for production of tritium to the Nuclear Regulatory (NRC), a necessary prerequisite for the safety evaluation and acceptance by the NRC. - Complete documentation to support the Department's primary path decision. - Begin Preliminary/Final Design activities for the Tritium Extraction Facility, to be located at SRS. (project funding is in the Defense Asset Acquisition account)
<p><i>FUNDING LEVELS:</i></p> <p>\$75,000</p>	<p>\$150,000</p>	<p>\$184,485</p>

Weapons Stockpile Management Materials Surveillance

The Materials Surveillance Program (formerly the Materials Surveillance and Technical Support Program) funds the storage, handling, shipping, safeguarding, control and accountability, and disposition for Defense Programs (DP) nuclear materials located at former DP facilities that have been transferred to Environmental Management at the Fernald, Hanford, Idaho, Rocky Flats, and Savannah River sites. This program also supports programmatic activities that include: the operation of Bldg 9206 at Y-12 Plant until phaseout and transfer to Bldg 9212; decontamination and refinement of surplus precious metals; operation of U-233 Storage and Distribution Center; coordination with U.S. Enrichment Corporation for sale of excess low enriched uranium; safeguards and security protection for, and disposition of DP-owned nuclear materials (SNM) at Fernald, Idaho, Hanford, Rocky Flats, and Savannah River.

Defense Programs intends to reduce our holdings of nuclear material in order to consolidate in fewer locations, thereby enhancing our safeguards and security position and reducing costs.

- Disposition or consolidate material at Y-12.
- Sale of excess materials at Fernald and K-25, OR.
- Consolidation of materials at Rocky Flats and package for shipment offsite.

PROGRAM GOALS/ONGOING ACTIVITIES:

- Provide for safeguards and surveillance of DP plutonium; monitoring & storage of depleted, normal, low and highly enriched uranium; plan for disposition (transfer, sale, discard) of depleted, normal & low enriched uranium.
- Oversight/Operation of Central Scrap Management Office for uranium scrap consolidation and management.
- Consolidation of surplus precious metals into DOE precious metals pool.
- Continued safe operation of the U-233 Storage and Distribution Center in Building 3019 at the Oak Ridge National Laboratory.
- Manage processing of irradiated Mark 42 targets for weapons R&D and manage sale & loan program for Californium-252.
- Oversee LANL program to receive and process excess plutonium-beryllium sources from universities, etc.
- Continue implementation of lithium sales at the OR K-25 Plant and the Portsmouth Gaseous Diffusion Plant.
- Continue consolidation of materials surveillance activities from Building 9206 to 9212 at Y-12.
- Consolidation of heavy water from Savannah River Site to Oak Ridge Reservation.

CHANGE FROM FY 1997:

FY 1998 program for Materials Surveillance is essentially level with FY 1997.

MEASURABLE PERFORMANCE ACTIVITIES:

<p><u>FY 1996:</u></p> <ul style="list-style-type: none"> - Began shipment of 706 metric tons of excess uranium billets to the United Kingdom. - Begin to relocate/consolidate remaining excess uranium out of surplus facilities at INEL to a centralized storage location. - Complete shipment of 200 metric tons of Fernald uranium to Manufacturing Sciences Corp. - Began transfer of 212 metric tons of Fernald normal uranium to Allied Signal. - Began shipment of surplus lithium hydroxide to buyers. - Received U-233 from Mound Plant; safely stored it and balance of U-233 materials at ORNL in Building 3019 repository in safeguarded dry storage wells. - Developed DOE-approved Basis for Interim Operations and updated the Operational Safety Requirements for Building 3019 repository. - Other ongoing activities. 	<p><u>FY 1997:</u></p> <ul style="list-style-type: none"> - Complete shipment of 706 metric tons of excess uranium billets to the United Kingdom from Hanford. - Continue to relocate/consolidate any remaining excess uranium out of surplus facilities to a centralized storage location. - Complete shipment of 212 metric tons of Fernald normal uranium to Allied Signal. - Continue shipment of surplus lithium hydroxide to buyers. - Begin shipment of 800 metric tons of excess low enriched uranium (LEU) from Fernald to British Nuclear Fuels Ltd (BNFL). - Determine buyer for excess low enriched uranium at Hanford. Begin shipment (funding requirements not determined). - Continue safe, secure storage of U-233 at ORNL in Building 3019 repository. - Continue progress on enhancing the Basis for Interim Operations and development of a Safety Analysis Report for Building 3019 repository. - Begin shipment (tentative) of 350 metric tons of low enriched uranium to SRS for Tennessee Valley Authority reactor fuel project (funding estimate pending). - Other ongoing activities. 	<p><u>FY 1998:</u></p> <ul style="list-style-type: none"> - Complete shipment of 800 metric tons of excess low enriched uranium from Fernald to British Nuclear Fuels. - Continue to relocate/consolidate any remaining excess uranium out of surplus facilities to a centralized storage location. - Continue shipment of metric tons (quantity TBD) of excess low enriched uranium from Hanford to TBD buyer (funding requirements not determined). - Continue shipment of surplus lithium hydroxide to buyers. - Continue/complete shipment of 350 metric tons of low enriched uranium to SRS for Tennessee Valley Authority reactor fuel project. - Continue safe, secure storage of U-233 in Building 3019 repository. - Continue progress on enhancing the Basis for Interim Operations and development of a Safety Analysis Report for Building 3019 repository. - Other ongoing activities.
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FUNDING LEVELS:

\$109,811	\$112,120	\$107,000
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DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands, Narrative in whole dollars)

DEFENSE PROGRAMS
STOCKPILE MANAGEMENT

Beginning in FY 1998, all line item construction projects are shown in the Defense Asset Acquisition account. Funding for FY 1996 and FY 1997 is reflected in the Stockpile Management decision unit. For information purposes, the following section explains significant changes from FY 1997 in construction line items funding in support of the Stockpile Management mission. The major change in funding for line-item construction projects, now shown in the Defense Assets Acquisition account is the transition to full up-front funding for logical phases of construction projects. New projects for FY 1998 include: design funding for the Stockpile Management Restructuring Initiative at the Savannah River Site (TEC-\$68.8 million, FY 1998-\$14.3 million) and Y-12 Plant (TEC-\$41.6 million, FY 1998-\$7.3 million), design funding for Tritium (TEC-TBD, FY 1998-\$168.6 million) and the Tritium Extraction Facility (TEC-TBD, FY 1998-\$39.5 million). Funding is also included to complete construction of the Chemistry and Metallurgy Research Building (TEC-\$174.1 million, FY 1998-\$106.4).

Stockpile Management Restructuring Initiative

The Stockpile Management Restructuring Initiative will support the implementation of Departmental decisions related to production facility downsizing or relocation of missions consistent with the Stockpile Stewardship and Management Programmatic Environmental Impact Statement and the Tritium Supply and Recycling PEIS Records of Decision. The Record of Decision for restructuring the stockpile management complex was announced on December 19, 1996. It involves the downsizing in place of weapons assembly/ disassembly and high explosives at the Pantex Plant, nonnuclear component fabrication at the Kansas City Plant, weapons secondary and case fabrication at the Y-12 Plant, consolidation of existing tritium operations at the Savannah River Site and the reestablishment of a small pit component fabrication capacity at the Los Alamos National Laboratory. In FY 1998, the Department is proceeding with engineering design activities at the Y-12 Plant and the Savannah River Site. Funding for this effort is included in the Defense Fixed Asset Acquisition account. At the Los Alamos National Laboratory, Kansas City Plant, and Pantex Plant, FY 1998 efforts will focus on conceptual design activities in preparation for the initiation of construction project line items in FY 1999.

Tritium Source

Two tritium source construction projects are included in the Defense Asset Acquisition account. The FY 1998 scope of the projects include fully funding the Titles I & II design of the CLWR Tritium Extraction Facility (\$39.5million) and fully funding the Title I design of the Accelerator Production of Tritium (APT) plant (\$168.6million). Detailed data sheets are included in the Defense Asset Acquisition account section of the budget.

DEFENSE PROGRAMS
CONSTRUCTION PROJECT SUMMARY

Defense Programs Stockpile Management
Dollars in Thousands

Project Number	Project Title	*	TEC	Previous Approp	Weapons Activities		Defense Asset Acquisition	
					FY 1996 Approp.	FY 1997 Approp.	FY 1998 Request	FY 1999 Request
99-D-XXX	SMRI-Capability Maint & Improvements Project, LANL	\$	601,000	\$ 0	\$ 0	\$ 0	\$ 0	\$ 55,000
99-D-XXX	SMRI-Kansas City Plant II, KC		100,184	0	0	0	0	15,000
99-D-XXX	SMRI-Pantex Consolidation, PX		30,853	0	0	0	0	4,744
98-D-126	Accelerator Production of Tritium (APT), VL		TBD	0	0	0	168,590	274,187
98-D-125	Tritium Extraction Facility, SRS		TBD	0	0	0	39,453	120,170
98-D-124	SMRI-Y-12 Consolidation, Y-12		41,639	0	0	0	7,311	35,189
98-D-123	SMRI-Tritium Fac. Modernization & Consolidation, SR		68,790	0	0	0	14,343	54,447
97-D-124	Steam Plant Wastewater Treatment Facility Upgrade, Y-12		2,500	0	0	600	1,900	0
97-D-123	Structural Upgrades, KC		18,000	0	0	1,400	16,600	0
97-D-122	Nuclear Materials Storage Facility Renovation, LANL		45,292	0	0	4,000	41,292	0
97-D-121	Consolidated Pit Packaging System, PX		870	0	0	870	0	0
96-D-126	Tritium Loading Line Modifications, SR		12,200	0	12,200	0	0	0
96-D-125	Washington Measurements Operations Fac., Andrews Air Force Base, Camp Springs, Maryland		4,725	0	900	3,825	0	0
96-D-123	Retrofit Chillers, Y-12		12,800	0	3,100	7,000	2,700	0
96-D-122	Sewage Treatment Upgrade, PX		11,300	0	600	100	10,600	0
95-D-122	Sanitary Sewer Upgrades, Y-12		32,000	2,200	6,300	10,900	12,600	0
95-D-102	CMR Upgrades Project, LANL		174,100	0	0	0	106,360	0
94-D-128	ES&H Analytical Laboratory, PX		8,800	1,800	4,000	0	3,000	0
94-D-127	Emergency Notification System, PX		6,200	2,000	2,000	2,200	0	0
94-D-125	Upgrade Life Safety, KC		14,700	2,000	5,500	5,200	2,000	0
94-D-124	Hydrogen Fluoride Supply System, Y-12		26,300	11,300	8,700	4,900	1,400	0
93-D-122	Life Safety Upgrades, Y-12		29,200	12,700	7,200	7,200	2,100	0
93-D-123	Nonnuclear Reconfiguration, Complex 21, VL		164,552	109,000	41,065	14,487	0	0
92-D-126	Replace Emergency Notification System, VL		28,800	25,600	0	0	3,200	0
88-D-123	Security Enhancements, PX		125,000	101,861	13,400	9,739	0	0

Continued:

88-D-122 Facilities Capability Assurance Program (FCAP), VL						
90-17 Production Plating Shop Replacement, Y-12	9,660	18,400	(6,041) ^{2/}	0	0	0
91-24 Renovate Water Supply System, PX	10,050	9,500	0	550	0	0
91-27 Refurbish Power Supply, Y-12	54,597	39,347	1,100	5,000	9,150	0
92-31 Replace/Refurbish Deteriorated Elevators, Y-12	9,420	6,220	2,200	1,000	0	0
93-35 Upgrade Material Engineering Lab, KC	11,700	5,360	0	2,470	3,870	0
94-37 Chilled Water System Replacement, KC	6,200	8,700	(2,000)	(500)	0	0
94-38 Roads and Parking Upgrade, PX	13,300	5,259	8,041	0	0	0
95-39 Replace Compressed Air System, PX	3,900	410	420	3,070	0	0
95-40 Replace Fire Mains, KC	4,300	4,900	0	(600)	0	0
96-41 Replace Cooling Tower, East, KC	5,020	0	1,570	3,450	0	0
97-42 Hydraulic Press, Y-12	14,000	0	0	7,500	6,500	0
Adjustments	0	0	3,370 ^{3/}	0	0	
Fully Funded Projects	<u>256,577</u>	<u>256,577</u>	<u>0</u>	<u>0</u>	<u>0</u>	
Subtotal, FCAP	398,724	354,673	8,660	21,940	19,520	0
TOTAL, WEAPONS STOCKPILE MANAGEMENT CONSTRUCTION	<u>\$ 1,958,529</u>	<u>\$ 623,134</u>	<u>\$ 113,625</u>	<u>\$ 94,361</u>	<u>\$ 452,969</u>	<u>\$ 558,737</u>

FOOTNOTES

1/ Consistent with the transfer of nuclear materials facilities at LANL as discussed in the program mission section of Stockpile Management, the CMR project has been moved from Stewardship to Management for FY 1998.

2/ \$2,699,100 prior year balance was used towards the FY 1996 offset

3/ \$2,370,000 from delayed/under review subproject 93-35, and \$1,000,000 from downscoped subproject 94-37, was used towards the FY 1996 offset.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project: Stockpile Management Restructuring Initiative -
Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee

2a. Project No. 98-D-124
2b. Construction Funded

3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 1st Qtr. FY 1998

5. Previous Cost Estimate:
Total Estimated Cost (TEC) -- None
Total Project Cost (TPC) -- None

3b. A-E Work (Titles I & II) Duration: 28 months

4a. Date Physical Construction Starts: 2nd Qtr. FY 1999

6. Current Cost Estimate:
TEC -- \$42,500
TPC -- \$52,800

4b. Date Construction Ends: 4th Qtr. FY 2002

7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1998	\$ 7,311	\$ 0	\$ 6,450	\$ 2,000
1999	35,189	0	10,700	8,400
2000	0	0	11,900	9,900
2001	0	0	11,100	14,800
2002	0	0	2,350	7,400

8. Project Description, Justification, and Scope

In 1994, production operations were curtailed at three of the seven weapons production facilities (Mound in Ohio, Pinellas in Florida, and Rocky Flats in Colorado). Their production responsibilities were transferred to two of the remaining four production plants (Kansas City Plant and Savannah River Site (SRS)) and to two of the national laboratories (Los Alamos National Laboratory (LANL) and Sandia National Laboratories, New Mexico). After the closure of these production operations, studies were continued to determine the optimum size and configuration of the nuclear weapons complex. It was recognized that the remaining four production facilities provided excess capacity than that required to support the projected stockpile, and that further closure and consolidation or significant downsizing of operations was necessary. Studies were begun in late 1994 to address whether the reduced stockpile levels necessitated further plant

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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closures and consolidation/collocation at the weapons laboratories or supported the downsizing of operations at the existing production plants. These studies were used to assess all reasonable alternatives which required little or no construction of new facilities. The result of these in-depth programmatic assessments of these alternatives studies culminated in the development and approval of the Justification of Mission Need document and the Critical Decision I authorization for the Stockpile Management Restructuring Initiative (SMRI) on April 2, 1996.

The SMRI will support the implementation of Departmental decisions related to production facility downsizing or relocation of missions consistent with the Stockpile Stewardship and Management (SSM) Programmatic Environmental Impact Statement (PEIS) and the Tritium Supply and Recycling PEIS Records of Decision (ROD). The preferred alternative for restructuring the stockpile management complex was announced by the Secretary of Energy on February 28, 1996. The Secretary of Energy approved a ROD for the Tritium Supply and Recycling PEIS on December 5, 1995.

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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8. Project Description, Justification, and Scope (Continued)

The goal of the Stockpile Management Program, as implemented by the SMRI, is to attain the following objectives: (1) fully support the evaluation, enhanced surveillance, maintenance, and repair of the enduring stockpile; (2) provide flexibility to respond to new requirements or to achieve further reductions in the stockpile size; (3) maintain and improve (where necessary) the manufacturing technology necessary to fully support the stockpile; and (4) achieve significant reductions in operating costs for the complex.

The SMRI involves (1) the downsizing of weapons assembly/disassembly and high explosives missions, and the establishment of non-intrusive pit reuse mission at the Pantex Plant; (2) downsizing nonnuclear component manufacturing at the Kansas City Plant; (3) downsizing weapons secondary and case fabrication at the Oak Ridge Y-12 Plant; (4) consolidation of existing tritium operations at the SRS; and (5) the reestablishment of a minimal pit component fabrication capacity at LANL.

No new facilities are being proposed for implementing the SMRI. Existing facilities will be utilized to the maximum extent possible. All existing facilities that have been identified for utilization under each site-specific recommended alternative will be repaired, upgraded, and/or modified to meet current environment, safety, and health requirements. In addition, they will be configured to maximize effectiveness and efficiency in support of the site-specific downsizing and/or consolidation management capability requirements for the smaller stockpile.

* The consolidation of the Canned Subassemblies mission will reduce the existing active Defense Programs (DP) footprint to approximately 665,000 square feet and will include all DP functions (production, storage, Administration, etc.) associated with the production mission for secondaries and cases. The consolidation work will take place in Buildings 9201-5N, 9204-2E, and the 9215/9998 complex (including two wings of Building 9212), and peripheral support buildings. In addition, two additional facilities will be held in "cold standby" (Building 9201-5W and 9204-2 ground floor). The facilities work required includes (1) capital equipment relocation; (2) capital equipment procurement and installation; (3) facility upgrades to meet natural phenomena code requirements; and (4) preparation of cold standby facilities.

* In FY 1998, funding is requested for design activities.

The primary purpose of this project is to enable the Y-12 Plant to continue in the responsibility for the "secondary mission" within a more cost-effective footprint. The Y-12 Plant has the required capability for the mission; however, the oversized configuration of the site can not be supported with current projections of funding levels.

Operations at Y-12 will be sized consistent with projected workload requirements. The long-term missions that will remain at the Y-12 Plant are: (1) fabrication of components for weapon secondaries; (2) assembly/disassembly and surveillance of weapon secondaries and cases; and (3) potentially, storage of the Nation's strategic reserves of highly-enriched uranium.

This Y-12 downsizing will consolidate all secondary and case manufacturing processes into significantly fewer existing production buildings. The cold standby facilities will be furnished with existing excess equipment. Two production buildings will be maintained in a cold standby status as a contingency.

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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8. Project Description, Justification, and Scope (Continued)

The activities associated with the project centralizes the DP production functions in the western area of the Y-12 Plant. The 10 subprojects will consist of the following tasks:

- Relocation and/or hook-up of several machine tools to Building 9215 M-wing for the Enriched Uranium machining function.
- Relocation of the Can Shop production operation from Building 9201-1 to Building 9215 P-wing.
- Placing Building 9201-5W Machine Shop in a "Cold Standby" status to reduce utility costs, but maintain surge production capability.
- Providing a depleted uranium sawing operation, and a furnace for dismantled weapon material consolidation in Building 9212 A-2 Wing.
- Relocating Ceramic Machining equipment from Building 9201-5E to Building 9998 G3 Area.
- Relocation and/or replacement of Lithium Deuteride/Hydride production equipment from Building 9204-2 to Building 9998 G3 area.
- Placing Building 9204-2 first floor Lithium Salt Machining and Inspection area in "Cold Standby" and minimizing facility operational costs in the remainder of the building.
- Relocation of Lithium Salt Machining operations from Building 9204-2 to Building 9204-2E.
- Relocation of Special Material Pilot Plant facility function from Building 9731 to Building 9805-1 with capacity enhancements to the existing developmental equipment to allow for production operations.
- Natural Phenomena upgrades of facilities to meet required structural integrity. Facilities include Buildings 9996/9212 A-2 wing; Building 9998; Building 9215; Building 9201-5N; and Building 9204-2E.

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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9. Details of Cost Estimate

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 6,800
(1) Engineering design and inspection at approximately 19 percent of construction costs	\$ 5,300	
(2) Construction management costs	0	
(3) Project management at	1,500	
b. Land and land rights		0
c. Construction costs		28,040
1. Improvements to land		
2. Buildings		
3. Special equipment		
4. Utilities		
5. Demolition		
d. Standard equipment		0
e. Major computer items		0
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout and acceptance		580
h. Subtotal (a through g)		\$ 35,420
i. Contingencies at approximately 20 percent of above costs	7,080	
j. Total line item cost (Section 11.a.1.(a))		\$ 42,500
k. LESS: Non-Federal contribution		0
l. Net Federal total estimated cost (TEC)		<u>\$ 42,500</u>

10. Method of Performance

Design and inspection will be performed under negotiated fixed-price architect-engineer contracts or by the Management and Operating (M&O) Contractor. Construction will be performed under fixed-price contracts awarded after competitive proposals, and administered by the Department of Energy and Contractor staff. However, M&O Contractor personnel may perform design, construction, and inspection work for activities determined to be cost effective. Procurement of standard equipment will be administered by the Department of Energy and M&O Contractor staff on the basis of competitive proposals.

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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11. Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1998	FY 1999	FY 2000	Outyears	Total
a. Total project costs						
1. Total facility costs						
(a) Line item (Section 9.j.)	\$ 0	\$ 2,000	\$ 8,400	\$ 9,900	\$ 22,200	\$ 42,500
(b) Plant, Engineering and Design (PE&D)	0	0	0	0	0	
(c) Operating expense funded equipment	0	0	0	0	0	
(d) Inventories	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
(e) Total facility cost (Federal and Non-Federal)	\$ 0	\$ 2,000	\$ 8,400	\$ 9,900	\$ 22,200	\$ 42,500
2. Other project costs						
(a) R&D necessary to complete project	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	0
(b) Conceptual design costs	1,500	0	0	0	0	1,500
© Decontamination and decommissioning (D&D)	0	0	0	0	0	0
(d) NEPA documentation costs	0	0	0	0	0	0
(e) Other project related costs	<u>0</u>	<u>0</u>	<u>2,600</u>	<u>3,000</u>	<u>3,200</u>	<u>8,800</u>
(f) Total other project costs	\$ <u>1,500</u>	\$ <u>0</u>	\$ <u>2,600</u>	\$ <u>3,000</u>	\$ <u>3,200</u>	\$ <u>10,300</u>
(g) Total project costs	\$ 1,500	\$ 2,000	\$ 11,000	\$ 12,900	\$ 25,400	\$ 52,800
(h) LESS: Non-Federal contribution	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
(i) Net Federal total project cost (TPC)	\$ <u>1,500</u>	\$ <u>2,000</u>	\$ <u>11,000</u>	\$ <u>12,900</u>	\$ <u>25,400</u>	\$ <u>52,800</u>
b. Related annual costs (estimated life of project--20 years) <u>a/</u>						
1. Facility operating costs						\$129,240
2. Facility maintenance and repair costs						13,452
3. Programmatic operating expenses directly related to the facility						0
4. Capital equipment not related to construction but related to the programmatic effort in the facility						0
5. GPP or other construction related to the programmatic effort in the facility						0
6. Utility costs						0
7. Other costs						<u>0</u>
Total related annual costs						<u>\$142,692</u>

a/ Assumptions for reduced operating costs are provided in the SSM PEIS and AIP and assume expense dollars are available for outyear decontamination and decommissioning activities.

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project costs

1. Total facility costs

- (a) Line item -- Construction line item costs for engineering design, procurement, and construction, and acceptance/operational startup activities to downsize and consolidate the existing Y-12 Plant -- \$42,500,000.
- (b) PE&D -- None.
- (c) Operating expense funded equipment -- None.
- (d) Inventories -- None.

2. Other project costs

- (a) R&D necessary to complete construction -- None.
- (b) Conceptual design -- Costs of \$1,500,000 have been expended to finalize the scope of the project.
- (c) Decontamination and Decommissioning (D&D) -- \$443,500,000. a/
- (d) NEPA documentation -- b/
- (e) Other project related funding -- Includes project support, design and technical oversight, and startup testing and readiness planning -- \$10,300,000.

b. Related annual costs

- 1. Facility operating costs -- \$129,240,000. a/
- 2. Facility maintenance and repair costs -- \$13,452,000 per year.
- 3. Programmatic operating expenses directly related to the facility -- included in 12.b.1.
- 4. Capital equipment not related to construction but related to the programmatic effort of the facility -- not applicable.
- 5. GPP or other construction related to the programmatic effort -- not applicable.
- 6. Utility costs -- included in 12.b.1.
- 7. Other Costs -- \$0.

a/ Assumptions for reduced operating costs are provided in the SSM PEIS and AIP and assume expense dollars are available for outyear decontamination and decommissioning activities.

b/ Primary NEPA documentation was completed in the Stockpile Stewardship and Management (SSM) Programmatic Environmental Impact Statement (PEIS). Other NEPA documentation for individual subprojects were approved as Categorical Exclusions which were completed as part of the Conceptual Design.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project: Stockpile Management Restructuring Initiative -
Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee

2a. Project No. 98-D-124

2b. Construction Funded

3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 1st Qtr. FY 1998

3b. A-E Work (Titles I & II) Duration: 28 months

5. Previous Cost Estimate:

Total Estimated Cost (TEC) -- None

Total Project Cost (TPC) -- None

4a. Date Physical Construction Starts: 2nd Qtr. FY 1999

4b. Date Construction Ends: 4th Qtr. FY 2002

6. Current Cost Estimate:

TEC -- \$42,500

TPC -- \$52,800

7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1998	\$ 7,311	\$ 0	\$ 6,450	\$ 2,000
1999	35,189	0	10,700	8,400
2000	0	0	11,900	9,900
2001	0	0	11,100	14,800
2002	0	0	2,350	7,400

8. Project Description, Justification, and Scope

In 1994, production operations were curtailed at three of the seven weapons production facilities (Mound in Ohio, Pinellas in Florida, and Rocky Flats in Colorado). Their production responsibilities were transferred to two of the remaining four production plants (Kansas City Plant and Savannah River Site (SRS)) and to two of the national laboratories (Los Alamos National Laboratory (LANL) and Sandia National Laboratories, New Mexico). After the closure of these production operations, studies were continued to determine the optimum size and configuration of the nuclear weapons complex. It was recognized that the remaining four production facilities provided excess capacity than that required to support the projected stockpile, and that further closure and consolidation or significant downsizing of operations was necessary. Studies were begun in late 1994 to address whether the reduced stockpile levels necessitated further plant

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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closures and consolidation/collocation at the weapons laboratories or supported the downsizing of operations at the existing production plants. These studies were used to assess all reasonable alternatives which required little or no construction of new facilities. The result of these in-depth programmatic assessments of these alternatives studies culminated in the development and approval of the Justification of Mission Need document and the Critical Decision I authorization for the Stockpile Management Restructuring Initiative (SMRI) on April 2, 1996.

The SMRI will support the implementation of Departmental decisions related to production facility downsizing or relocation of missions consistent with the Stockpile Stewardship and Management (SSM) Programmatic Environmental Impact Statement (PEIS) and the Tritium Supply and Recycling PEIS Records of Decision (ROD). The preferred alternative for restructuring the stockpile management complex was announced by the Secretary of Energy on February 28, 1996. The Secretary of Energy approved a ROD for the Tritium Supply and Recycling PEIS on December 5, 1995.

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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8. Project Description, Justification, and Scope (Continued)

The goal of the Stockpile Management Program, as implemented by the SMRI, is to attain the following objectives: (1) fully support the evaluation, enhanced surveillance, maintenance, and repair of the enduring stockpile; (2) provide flexibility to respond to new requirements or to achieve further reductions in the stockpile size; (3) maintain and improve (where necessary) the manufacturing technology necessary to fully support the stockpile; and (4) achieve significant reductions in operating costs for the complex.

The SMRI involves (1) the downsizing of weapons assembly/disassembly and high explosives missions, and the establishment of non-intrusive pit reuse mission at the Pantex Plant; (2) downsizing nonnuclear component manufacturing at the Kansas City Plant; (3) downsizing weapons secondary and case fabrication at the Oak Ridge Y-12 Plant; (4) consolidation of existing tritium operations at the SRS; and (5) the reestablishment of a minimal pit component fabrication capacity at LANL.

No new facilities are being proposed for implementing the SMRI. Existing facilities will be utilized to the maximum extent possible. All existing facilities that have been identified for utilization under each site-specific recommended alternative will be repaired, upgraded, and/or modified to meet current environment, safety, and health requirements. In addition, they will be configured to maximize effectiveness and efficiency in support of the site-specific downsizing and/or consolidation management capability requirements for the smaller stockpile.

* The consolidation of the Canned Subassemblies mission will reduce the existing active Defense Programs (DP) footprint to approximately 665,000 square feet and will include all DP functions (production, storage, Administration, etc.) associated with the production mission for secondaries and cases. The consolidation work will take place in Buildings 9201-5N, 9204-2E, and the 9215/9998 complex (including two wings of Building 9212), and peripheral support buildings. In addition, two additional facilities will be held in "cold standby" (Building 9201-5W and 9204-2 ground floor). The facilities work required includes (1) capital equipment relocation; (2) capital equipment procurement and installation; (3) facility upgrades to meet natural phenomena code requirements; and (4) preparation of cold standby facilities.

* In FY 1998, funding is requested for design activities.

The primary purpose of this project is to enable the Y-12 Plant to continue in the responsibility for the "secondary mission" within a more cost-effective footprint. The Y-12 Plant has the required capability for the mission; however, the oversized configuration of the site can not be supported with current projections of funding levels.

Operations at Y-12 will be sized consistent with projected workload requirements. The long-term missions that will remain at the Y-12 Plant are: (1) fabrication of components for weapon secondaries; (2) assembly/disassembly and surveillance of weapon secondaries and cases; and (3) potentially, storage of the Nation's strategic reserves of highly-enriched uranium.

This Y-12 downsizing will consolidate all secondary and case manufacturing processes into significantly fewer existing production buildings. The cold standby facilities will be furnished with existing excess equipment. Two production buildings will be maintained in a cold standby status as a contingency.

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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8. Project Description, Justification, and Scope (Continued)

The activities associated with the project centralizes the DP production functions in the western area of the Y-12 Plant. The 10 subprojects will consist of the following tasks:

- Relocation and/or hook-up of several machine tools to Building 9215 M-wing for the Enriched Uranium machining function.
- Relocation of the Can Shop production operation from Building 9201-1 to Building 9215 P-wing.
- Placing Building 9201-5W Machine Shop in a "Cold Standby" status to reduce utility costs, but maintain surge production capability.
- Providing a depleted uranium sawing operation, and a furnace for dismantled weapon material consolidation in Building 9212 A-2 Wing.
- Relocating Ceramic Machining equipment from Building 9201-5E to Building 9998 G3 Area.
- Relocation and/or replacement of Lithium Deuteride/Hydride production equipment from Building 9204-2 to Building 9998 G3 area.
- Placing Building 9204-2 first floor Lithium Salt Machining and Inspection area in "Cold Standby" and minimizing facility operational costs in the remainder of the building.
- Relocation of Lithium Salt Machining operations from Building 9204-2 to Building 9204-2E.
- Relocation of Special Material Pilot Plant facility function from Building 9731 to Building 9805-1 with capacity enhancements to the existing developmental equipment to allow for production operations.
- Natural Phenomena upgrades of facilities to meet required structural integrity. Facilities include Buildings 9996/9212 A-2 wing; Building 9998; Building 9215; Building 9201-5N; and Building 9204-2E.

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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9. Details of Cost Estimate

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 6,800
(1) Engineering design and inspection at approximately 19 percent of construction costs	\$ 5,300	
(2) Construction management costs	0	
(3) Project management at	1,500	
b. Land and land rights		0
c. Construction costs		28,040
1. Improvements to land		
2. Buildings		
3. Special equipment		
4. Utilities		
5. Demolition		
d. Standard equipment		0
e. Major computer items		0
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout and acceptance		580
h. Subtotal (a through g)		\$ 35,420
i. Contingencies at approximately 20 percent of above costs	7,080	
j. Total line item cost (Section 11.a.1.(a))		\$ 42,500
k. LESS: Non-Federal contribution		0
l. Net Federal total estimated cost (TEC)		<u>\$ 42,500</u>

10. Method of Performance

Design and inspection will be performed under negotiated fixed-price architect-engineer contracts or by the Management and Operating (M&O) Contractor. Construction will be performed under fixed-price contracts awarded after competitive proposals, and administered by the Department of Energy and Contractor staff. However, M&O Contractor personnel may perform design, construction, and inspection work for activities determined to be cost effective. Procurement of standard equipment will be administered by the Department of Energy and M&O Contractor staff on the basis of competitive proposals.

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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11. Schedule of Project Funding and Other Related Funding Requirements

	Prior Years	FY 1998	FY 1999	FY 2000	Outyears	Total
a. Total project costs						
1. Total facility costs						
(a) Line item (Section 9.j.)	\$ 0	\$ 2,000	\$ 8,400	\$ 9,900	\$ 22,200	\$ 42,500
(b) Plant, Engineering and Design (PE&D)	0	0	0	0	0	
(c) Operating expense funded equipment	0	0	0	0	0	
(d) Inventories	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
(e) Total facility cost (Federal and Non-Federal)	\$ 0	\$ 2,000	\$ 8,400	\$ 9,900	\$ 22,200	\$ 42,500
2. Other project costs						
(a) R&D necessary to complete project	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	0
(b) Conceptual design costs	1,500	0	0	0	0	1,500
© Decontamination and decommissioning (D&D)	0	0	0	0	0	0
(d) NEPA documentation costs	0	0	0	0	0	0
(e) Other project related costs	<u>0</u>	<u>0</u>	<u>2,600</u>	<u>3,000</u>	<u>3,200</u>	<u>8,800</u>
(f) Total other project costs	\$ <u>1,500</u>	\$ <u>0</u>	\$ <u>2,600</u>	\$ <u>3,000</u>	\$ <u>3,200</u>	\$ <u>10,300</u>
(g) Total project costs	\$ 1,500	\$ 2,000	\$ 11,000	\$ 12,900	\$ 25,400	\$ 52,800
(h) LESS: Non-Federal contribution	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
(i) Net Federal total project cost (TPC)	\$ <u>1,500</u>	\$ <u>2,000</u>	\$ <u>11,000</u>	\$ <u>12,900</u>	\$ <u>25,400</u>	\$ <u>52,800</u>
b. Related annual costs (estimated life of project--20 years) <u>a/</u>						
1. Facility operating costs						\$129,240
2. Facility maintenance and repair costs						13,452
3. Programmatic operating expenses directly related to the facility						0
4. Capital equipment not related to construction but related to the programmatic effort in the facility						0
5. GPP or other construction related to the programmatic effort in the facility						0
6. Utility costs						0
7. Other costs						<u>0</u>
Total related annual costs						<u>\$142,692</u>

a/ Assumptions for reduced operating costs are provided in the SSM PEIS and AIP and assume expense dollars are available for outyear decontamination and decommissioning activities.

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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1. Title and Location of Project: Stockpile Management Restructuring Initiative - Y-12 Consolidation, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 98-D-124 2b. Construction Funded
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12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project costs

1. Total facility costs

- (a) Line item -- Construction line item costs for engineering design, procurement, and construction, and acceptance/operational startup activities to downsize and consolidate the existing Y-12 Plant -- \$42,500,000.
- (b) PE&D -- None.
- (c) Operating expense funded equipment -- None.
- (d) Inventories -- None.

2. Other project costs

- (a) R&D necessary to complete construction -- None.
- (b) Conceptual design -- Costs of \$1,500,000 have been expended to finalize the scope of the project.
- (c) Decontamination and Decommissioning (D&D) -- \$443,500,000. a/
- (d) NEPA documentation -- b/
- (e) Other project related funding -- Includes project support, design and technical oversight, and startup testing and readiness planning -- \$10,300,000.

b. Related annual costs

- 1. Facility operating costs -- \$129,240,000. a/
- 2. Facility maintenance and repair costs -- \$13,452,000 per year.
- 3. Programmatic operating expenses directly related to the facility -- included in 12.b.1.
- 4. Capital equipment not related to construction but related to the programmatic effort of the facility -- not applicable.
- 5. GPP or other construction related to the programmatic effort -- not applicable.
- 6. Utility costs -- included in 12.b.1.
- 7. Other Costs -- \$0.

a/ Assumptions for reduced operating costs are provided in the SSM PEIS and AIP and assume expense dollars are available for outyear decontamination and decommissioning activities.

b/ Primary NEPA documentation was completed in the Stockpile Stewardship and Management (SSM) Programmatic Environmental Impact Statement (PEIS). Other NEPA documentation for individual subprojects were approved as Categorical Exclusions which were completed as part of the Conceptual Design.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1.	Title and Location of Project:
Stockpile Management Restructuring Initiative -	2a. Project No. 98-D-123
Tritium Facility Modernization and Consolidation	
2b. Construction Funded	
Savannah River Plant, Aiken, South Carolina	

3a. Date A-E Work Initiated, (Title I Design Start Scheduled):	2nd Qtr. FY 1998	5. Previous Cost Estimate:	
None		Total Estimated Cost (TEC)	--
3b. A-E Work (Titles I & II) Duration:	22 months	Total Project Cost (TPC)	--
None			

4a. Date Physical Construction Starts:	1st Qtr. FY 1999	6. Current Cost Estimate:	
		TEC --	\$68,790 <u>1</u> /
4b. Date Construction Ends:	2nd Qtr. FY 2003	TPC --	\$85,540

7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1998	\$ 14,343	\$ 0	\$ 11,000	\$ 9,000
1999	54,447	0	19,000	17,250
2000	0	0	24,351	19,481
2001	0	0	10,500	12,296
2002	0	0	3,939	8,610
2003	0	0	0	2,153

8. Project Description, Justification, and Scope

In 1994, production operations were curtailed at three of the seven weapons production facilities (Mound in Ohio, Pinellas in Florida, and Rocky Flats in Colorado). Their production responsibilities were transferred to two of the remaining four production plants (Kansas City Plant and Savannah River Site (SRS)) and to two of the national laboratories (Los Alamos

1/ Current CDR and project scope does not include process requirements for extraction capabilities needed to support commercial Light Water Reactor program. The additional process capacity that could be added to the project scope are: (1) Product Vessel/Hydride Transport Vessel-Unloading; (2) Primary Separation; (3) Process Stripper/Tritium Recovery; (4) Isotope Separation-H2 Stripping; (5) Isotope Separation-T2 Enrichment; and (6) Glovebox Stripper/Tritium Recovery.

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Tritium Facility Modernization and Consolidation	2a. Project No. 98-D-123
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2b. Construction Funded

Savannah River Plant, Aiken, South Carolina (Continued)

National Laboratory (LANL) and Sandia National Laboratories, New Mexico). After the closure of these production operations, studies were continued to determine the optimum size and configuration of the nuclear weapons complex. It was recognized that the remaining four production facilities provided excess capacity than that required to support the projected stockpile, and that further closure and consolidation or significant downsizing of operations was necessary. Studies were begun in late 1994 to address whether the reduced stockpile levels necessitated further plant closures and consolidation/collocation at the weapons laboratories or supported the downsizing of operations at the existing production plants. These studies were used to assess all reasonable alternatives which required little or no construction of new facilities. The result of these in-depth programmatic assessments of these

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Tritium Facility Modernization and Consolidation	2a. Project No. 98-D-123
2b. Construction Funded Savannah River Plant, Aiken, South Carolina (Continued)	

8. Project Description, Justification, and Scope (Continued)

alternatives studies culminated in the development and approval of the Justification of Mission Need document and the Critical Decision I authorization for the Stockpile Management Restructuring Initiative (SMRI) on April 2, 1996.

The SMRI will support the implementation of Departmental decisions related to production facility downsizing or relocation of missions consistent with the Stockpile Stewardship and Management (SSM) Programmatic Environmental Impact Statement (PEIS) and the Tritium Supply and Recycling PEIS Records of Decision (ROD). The preferred alternative for restructuring the stockpile management complex was announced by the Secretary of Energy on February 28, 1996. The Secretary of Energy approved a ROD for the Tritium Supply and Recycling PEIS on December 5, 1995.

The goal of the Stockpile Management Program, as implemented by the SMRI, is to attain the following objectives: (1) fully support the evaluation, enhanced surveillance, maintenance, and repair of the enduring stockpile; (2) provide flexibility to respond to new requirements or to achieve further reductions in the stockpile size; (3) maintain and improve (where necessary) the manufacturing technology necessary to fully support the stockpile; and (4) achieve significant reductions in operating costs for the complex.

The SMRI involves (1) the downsizing of weapons assembly/disassembly and high explosives missions, and the establishment of non-intrusive pit reuse mission at the Pantex Plant; (2) downsizing nonnuclear component manufacturing at the Kansas City Plant; (3) downsizing weapons secondary and case fabrication at the Oak Ridge Y-12 Plant; (4) consolidation of existing tritium operations at the SRS; and (5) the reestablishment of a minimal pit component fabrication capacity at LANL.

No new facilities are being proposed for implementing the SMRI. Existing facilities will be utilized to the maximum extent possible. All existing facilities that have been identified for utilization under each site-specific recommended alternative will be repaired, upgraded, and/or modified to meet current environment, safety, and health requirements. In addition, they will be configured to maximize effectiveness and efficiency in support of the site-specific downsizing and/or consolidation management capability requirements for the smaller stockpile.

The cost, schedule and scope data for the Pantex Plant, Kansas City Plant, LANL, and Oak Ridge Y-12 Plant subprojects are based upon their site-specific, detailed technical studies and completed Activity Implementation Plans. CDRs are currently in progress and are scheduled for completion by the end of FY 1996, with the exception of LANL. The LANL CDR is scheduled for completion in December 1996. Each CDR will be formally validated, and an ICE review is being scheduled for each subproject. The projected completion of all the ICE reviews and project validations is December 1996.

The Tritium Facility Modernization and Consolidation Project will relocate several process systems and equipment and/or process functions from Buildings 232-H and 234-H into existing buildings within the Tritium Facility. High and Moderate hazard processes will be relocated into Building 233-H. Low Hazard processes will be relocated to the North end of Building 234-H. Selected support functions such as the Automatic Reservoir Management System (ARMS) computer, document control, shift turnover, and locker rooms will be relocated to a new general services support structure that will be located between Buildings 233-H and 234-H. Measuring and Test Equipment (MT&E) storage will be relocated to Building 249-H.

The consolidation of Tritium processing activities into Buildings 233-H, 249-H, and the newer portion of 234-H will improve

1. Title and Location of Project:	Stockpile Management Restructuring Initiative - Tritium Facility Modernization and Consolidation	2a. Project No.	98-D-123
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2b. Construction Funded

Savannah River Plant, Aiken, South Carolina (Continued)

the safety of operations, reduce environmental releases; improve productivity, and significantly reduce future operating costs.

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Tritium Facility Modernization and Consolidation	2a. Project No. 98-D-123
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2b. Construction Funded

Savannah River Plant, Aiken, South Carolina (Continued)

8. Project Description, Justification, and Scope (Continued)

The consolidation of equipment into fewer operating buildings will allow for the reduction of maintenance, operations, and support staffing. The closure of 232-H will further reduce the Defense Programs operating budget for the Savannah River Site (SRS). It is estimated that financial pay back for this project can be realized in approximately four years.

The requested FY 1998 funding of \$14,343,000 will be used for the award of Title I and II design, other engineering support, construction award of contracts for which design is complete in FY 1998 (Building 249-H, and new structure, construction management, project management, and procurement of engineering equipment.

The related annual funding is approximately \$330,000 for facility operating costs to cover the cost of routine maintenance, janitorial services, and related overhead costs, plus \$440,000 for repair and replacement.

9. Details of Cost Estimate

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 11,226
(1) Engineering design and inspection at approximately 20 percent of construction costs		\$ 7,148
(2) Construction management costs		1,937
(3) Project management at 6.0 percent of construction costs (Item c).		2,141
b. Land and land rights		
0		
c. Construction costs		
35,937		
1. Improvements to land		100
2. Buildings and building modification		4,515
3. Special equipment (including gloveboxes and tritium handling equipment)		29,652
4. Utilities		0
5. Demolition		215
6. Service equipment		1,455
d. Standard equipment		
0		
e. Major computer items		
0		
f. Removal cost less salvage		
1,350		
g. Design and project liaison, testing, checkout and acceptance		
2,179		
h. Subtotal (a through g)		
\$ 50,692		

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Tritium Facility Modernization and Consolidation 2a. Project No. 98-D-123

2b. Construction Funded

Savannah River Plant, Aiken, South Carolina (Continued)

i. Contingencies at approximately 35.7 percent of above costs. 18,098 1/
j. Total line item cost (Section 11.a.1.(a)).
\$ 68,790
k. LESS: Non-Federal contribution
0
l. Net Federal total estimated cost (TEC)
\$ 68,790

10. Method of Performance

The Management and Operating (M&O) contractor, Westinghouse Savannah River Company, will have overall project performance responsibility. Design will be on the basis of a negotiated architect-engineer contract. The M&O contractor will accomplish construction and procurement, utilizing fixed-price subcontracts awarded on the basis of competitive bidding to the extent feasible.

11. Schedule of Project Funding and Other Related Funding Requirements

		Prior Years	FY 1998	FY 1999	FY 2000	Outyears
<u>Total</u>						
a. Total project costs						
1. Total facility costs						
(a) Line item (Section 9.j.).	\$	0	\$ 9,000	\$ 17,250	\$ 19,481	\$
23,056 \$ 68,790						
(b) Plant, Engineering and Design (PE&D).		0	0	0	0	
0 0						
(c) Operating expense funded equipment		0	0	0	0	
0 0						
(d) Inventories		<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>0</u> <u>0</u>						
(e) Total facility cost (Federal and Non-Federal)	\$	0	\$ 9,000	\$ 17,250	\$ 19,481	\$
23,056 \$ 68,790						
2. Other project costs						
(a) R&D necessary to complete project	\$	1,800	\$ 546	\$ 0	\$ 0	\$

1/ Current CDR and project scope does not include process requirements for extraction capabilities needed to support commercial Light Water Reactor program. The additional processes to be added to the project scope are: (1) Product Vessel/Hydride Transport Vessel-Unloading; (2) Primary Separation; (3) Process Stripper/Tritium Recovery; (4) Isotope Separation-H2 Stripping; (5) Isotope Separation-T2 Enrichment; and (6) Glovebox Stripper/Tritium Recovery. Exact funding requirements for these activities will not be determined until the end of the 1st Qtr. FY 1997. Therefore, a slightly higher contingency is included to address the additional requirements.

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Tritium Facility Modernization and Consolidation		2a. Project No. 98-D-123				
2b. Construction Funded		Savannah River Plant, Aiken, South Carolina (Continued)				
0	\$ 2,346					
	(b) Conceptual design costs	300	0	0	0	0
300		(c) Decontamination and decommissioning (D&D)				
0	0	0	0	0	0	
	(d) NEPA documentation costs	0	0	0	0	0
0						
	(e) Other project related costs	300	691	1,200	1,600	
10,313	14,104					
	(f) Total other project costs	\$ 2,400	\$ 1,237	\$ 1,200	\$ 1,600	\$
10,313	\$ 16,750					
	(g) Total project costs	\$ 2,400	\$ 10,237	\$ 18,450	\$ 21,081	\$
33,369	\$ 85,540					
	(h) LESS: Non-Federal contribution	0	0	0	0	
0	0					
	(i) Net Federal total project cost (TPC)	\$ 2,400	\$ 10,237	\$ 18,450	\$ 21,081	\$
33,369	\$ 85,540					
b. Related annual costs (estimated life of project--30 years)						
	1. Facility operating costs					
. .	\$ 330					
	2. Facility maintenance and repair costs					
. .	440					
	3. Programmatic operating expenses directly related to the facility					
. .	3,350					
	4. Capital equipment not related to construction but related to the programmatic effort in the facility					
. .	30					
	5. GPP or other construction related to the programmatic effort in the facility					
. .	10					
	6. Utility costs					
. .	170					
	7. Other costs					
. .	0					
	Total related annual costs					
. .	\$ 4,330					

1. Title and Location of Project: Stockpile Management Restructuring Initiative - Tritium Facility Modernization and Consolidation	2a. Project No. 98-D-123
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2b. Construction Funded

Savannah River Plant, Aiken, South Carolina (Continued)

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project costs

1. Total facility costs

- (a) Line item -- \$68,790,000.
- (b) PE&D -- None.
- (c) Operating expense funded equipment -- None.
- (d) Inventories -- None.

2. Other project costs

- (a) R&D necessary to complete construction -- \$2,346,000.
- (b) Conceptual design -- \$300,000.
- (c) Decontamination and Decommissioning (D&D) -- None.
- (d) NEPA documentation -- None.
- (e) Other project related funding -- \$14,100,000 - includes project support, design and technical oversight and review, startup test plans and other planning functions.

b. Related annual costs

- 1. Facility operating costs -- Approximately \$330,000 per year (3 FTE) will be required to cover the cost of routine maintenance, janitorial services, and related overhead costs.
- 2. Facility maintenance and repair costs -- Approximately \$440,000 per year (4 FTE) for repair and replacement costs.
- 3. Programmatic operating expenses directly related to the facility -- The average annual cost of direct labor, procurement, and overhead is estimated at \$3,350,000 per year.
- 4. Capital equipment not related to construction but related to the programmatic effort of the facility -- \$30,000.
- 5. GPP or other construction related to the programmatic effort -- \$10,000.
- 6. Utility costs -- \$170,000 per year.
- 7. Other Costs -- None.

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DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project: Steam Plant Wastewater Treatment Facility Upgrade	2a.
Project No. 97-D-124	
Y-12 Plant, Oak Ridge, Tennessee	2b.
Construction Funded	

SIGNIFICANT CHANGES

- The total estimated cost (TEC) and total project cost (TPC) reduced from \$3,600,000 and \$4,100,000 respectively to \$2,500,000 and \$2,770,000.
- The scope deleted aeration and pH adjustment equipment, reduced size of building addition, and added permanent discharge line to the sanitary sewer.
- The schedule changes extended design start to 2nd Qtr. FY 1998.
- These cost, schedule and scope changes are per approved Baseline Change Proposal 77/SPWTFU-01.

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DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

<u>1.</u> Plant Wastewater Treatment Facility Upgrade Y-12 Plant, Oak Ridge, Tennessee	Title and Location of Project: Steam 2a. Project No. 97-D-124
2b. Construction Funded	

3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 2nd Qtr. FY 1997 3,600	5. Previous Cost Estimate: Total Estimated Cost (TEC) -- \$
3b. A-E Work (Titles I & II) Duration: 12 months 4,100	Total Project Cost (TPC) -- \$

4a. Date Physical Construction Starts: 3rd Qtr. FY 1998	6. Current Cost Estimate: TEC -- \$ 2,500
4b. Date Construction Ends: 4th Qtr. FY 1999	TPC -- \$ 2,770

7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1997	\$ 600	\$ 0	\$ 600	\$ 440
1998	1,900	0	1,900	1,060
1999	0	0	0	1,000

8. Project Description, Justification, and Scope

* The purpose of the project is to upgrade the existing facility to treat the wastewaters from the Steam Plant and thereby meet the discharge limits of the National Pollutant Discharge Elimination System (NPDES) permit.

* This project consists of installing filtration equipment to improve the existing process and an expansion of Building 9616-9 to accommodate the equipment and installation of a permanent discharge line to the sanitary sewer system.

The discharge of treated wastewaters from the Y-12 Plant, into East Fork Popular Creek (EFPC) must comply with the NPDES permit issued by the Tennessee Department of Environment and Conservation (TDEC). The NPDES permit issued is good for a period of five years, and is expected that each new permit will be more stringent than the last one. A series of NPDES permit infractions have occurred over the last few years at the Steam Plant Wastewaters Treatment Facility (SPWTF). This project, when completed, will provide the SPWTF an increased capability to comply with the NPDES permit.

1. Title and Location of Project: Steam Plant Wastewater Treatment Facility Upgrade Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 97-D-124 2b. Construction
Funded	

8. Project Description, Justification, and Scope (Continued)

If no remedial action is taken and violations continue, DOE and the Y-12 Plant could receive Notices of Violation (NOV) and be subject to criminal lawsuits. At present, a lawsuit initiated by the Friends-of-the-Earth, an environmentalist group, is in progress against DOE.

The FY 1998 funds will provide for Titles I and II engineering and associated project integration activities.

9. Details of Cost Estimate a/

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 710
(1) Engineering design and inspection at approximately 32 percent of construction costs, (Item c (Design, Drawings, and Specifications: \$201,000).		\$ 415
(2) Construction management costs		180
(3) Project management at 9 percent of construction costs (Item c).		115
b. Land and land rights		0
c. Construction costs		1,305
1. Improvements to land		0
2. Building additions.		420
3. Special equipment		770
4. Utilities		115
5. Demolition		0
d. Standard equipment		0
e. Major computer items		0
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout and acceptance		100
h. Subtotal (a through g)		\$ 2,115
i. Contingencies at approximately 18 percent of above costs		385
j. Total line item cost (Section 11.a.1.(a)).		

a/ These estimates are based on a conceptual design criteria issued in November 1996.

1. Title and Location of Project: Steam Plant Wastewater Treatment Facility Upgrade Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 97-D-124 2b. Construction
---	--

Funded

\$ 2,500	b/	
k.	LESS: Non-Federal contribution	
	<u>0</u>	
l.	Net Federal total estimated cost (TEC)	
	<u>\$ 2,500</u>	

b/ Applicable escalation rates are taken from the DOE Oak Ridge Field Office escalation multipliers issued August 1994. The escalation rates were based on escalation of 3.3 percent in FY 1997, 3.3 percent in FY 1998, and 3.2 percent for FY 1999 as amended.

1. Title and Location of Project: Steam Plant Wastewater Treatment Facility Upgrade
Y-12 Plant, Oak Ridge, Tennessee (Continued)

2a. Project No. 97-D-124
2b. Construction

Funded

10. Method of Performance

Title I and II design will be performed by an A-E. Lockheed Martin Energy Systems (LMES) will review and approve the design documents prepared by the A-E and will provide Title III field inspection and final utility connections. Procurement and construction will be performed by a fixed price subcontractor, with construction management to be provided by MK-Ferguson of Oak Ridge Company.

11. Schedule of Project Funding and Other Related Funding Requirements

<u>Total</u>	<u>Prior Years</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Outyears</u>
a. Total project costs					
1. Total facility costs					
(a) Line item (Section 9.j.)	\$ 0	\$ 2,500	\$ 0	\$ 440	\$ 1,060
1,000					
(b) Plant, Engineering and Design (PE&D)	0	0	0	0	0
0	0	0	0	0	0
(c) Operating expense funded equipment	0	0	0	0	0
0	0	0	0	0	0
(d) Inventories	0	0	0	0	0
0	0	0	0	0	0
(e) Total facility cost (Federal and Non-Federal)	\$ 0	\$ 2,500	\$ 0	\$ 440	\$ 1,060
1,000					
2. Other project costs					
(a) R&D necessary to complete project	\$ 0	148	0	0	0
0	\$ 0	148	0	0	0
(b) Conceptual design costs	0	0	0	0	0
0	0	0	0	0	0
(c) Decontamination and decommissioning (D&D)	0	0	0	0	0
0	0	0	0	0	0
(d) NEPA documentation costs	5	67	10	0	0
0	5	67	10	0	0
(e) Other project related costs	117	220	0	0	0
40	117	220	0	0	0
(f) Total other project costs	\$ 270	\$ 220	\$ 0	\$ 0	\$ 0
0	\$ 270	\$ 220	\$ 0	\$ 0	\$ 0
(g) Total project costs	\$ 0	\$ 2,770	\$ 220	\$ 450	\$ 1,060
1,040	\$ 0	\$ 2,770	\$ 220	\$ 450	\$ 1,060
(h) LESS: Non-Federal contribution	0	0	0	0	0
0	0	0	0	0	0
(i) Net Federal total project cost (TPC)	\$ 220	\$ 450	\$ 1,060	\$ 0	\$ 0

1. Title and Location of Project: Steam Plant Wastewater Treatment Facility Upgrade
Y-12 Plant, Oak Ridge, Tennessee (Continued)

2a. Project No. 97-D-124
2b. Construction

Funded

1,040

\$ 0

\$ 2,770

b. Related annual costs (estimated life of project--20 to 25 years)

1. Facility operating costs	\$ 20	
2. Facility maintenance and repair costs	6	3. Programmatic operating expenses directly related to the facility
		0
4. Capital equipment not related to construction but related to the programmatic effort in the facility	0	
5. GPP or other construction related to the programmatic effort in the facility	0	
6. Utility costs	15	
7. Other costs	0	
Total related annual costs	<u>\$ 41</u>	

1. Title and Location of Project: Steam Plant Wastewater Treatment Facility Upgrade Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No. 97-D-124 2b. Construction
---	--

Funded

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project costs

1. Total facility costs

- (a) Line item -- Construction line item costs for the engineering design, procurement, demolition, and construction are estimated to be \$2,500,000.
- (b) PE&D -- None.
- (c) Operating expense funded equipment -- None.
- (d) Inventories -- None.

2. Other project costs

- (a) R&D necessary to complete construction -- None.
- (b) Conceptual design -- Approximately \$148,000 was incurred to develop the scope of the project.
- (c) Decontamination and Decommissioning (D&D) -- None.
- (d) NEPA documentation -- Approximately \$5,000 was incurred for NEPA determination development cost.
- (e) Other project related funding -- Approximately \$117,000 will be expended on other project related items broken out as follows: design criteria, project execution plans, Engineering Report for the State of Tennessee, and operational test and startup costs.

b. Related annual costs

- 1. Facility operating costs -- The associated overhead for facility operating costs will cost approximately \$20,000 annually.
- 2. Facility maintenance and repair costs -- The annual costs for direct labor, materials and supplies, and associated overhead for maintenance and repair activity are estimated to cost approximately \$6,000.
- 3. Programmatic operating expenses directly related to the facility -- None.
- 4. Capital equipment not related to construction but related to the programmatic effort of the facility -- None.
- 5. GPP or other construction related to the programmatic effort -- None.
- 6. Utility costs -- \$15,000.
- 7. Other Costs -- None.

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DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1.	Title and Location of Project: Structural Upgrades	2a.
	Project No. 97-D-123	
	Kansas City Plant, Kansas City, Missouri	2b.
	Construction Funded	

SIGNIFICANT CHANGES

- The scope parameters of this project are being reviewed for possible adjustments to meet the programmatic needs of the Defense Program's (DP) Core Stockpile Management, Stockpile Management Restructuring Initiative (SMRI), currently being implemented throughout the DP's Complex within the Department of Energy. The corrective structural over stress repairs and wall reinforcements have been revalidated as supporting both the DP's Strategic Plan and life safety requirements for the Kansas City Plant. The amount of repairs and the specific areas of repairs are being looked at, again, to insure all areas within the footprint of the SMRI are repaired and/or reinforced. The \$1,400,000 appropriated in FY 1997 is on hold pending the outcome of this evaluation.

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DEFENSE ASSET ACQUISITION
 (Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

<u>1.</u> Structural Upgrades		Title and Location of Project: 2a. Project No. 97-D-123
Kansas City Plant, Kansas City, Missouri		
2b. Construction Funded		

3a. Date A-E Work Initiated, (Title I Design Start Scheduled):	2nd Qtr. FY 1997	5. Previous Cost Estimate:
\$18,000		Total Estimated Cost (TEC) --
3b. A-E Work (Titles I & II) Duration:	25 months	Total Project Cost (TPC) --
\$19,800		

4a. Date Physical Construction Starts:	3rd Qtr. FY 1998	6. Current Cost Estimate:
4b. Date Construction Ends:	3rd Qtr. FY 2003	TEC -- \$18,000
		TPC -- \$19,800

7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1997	\$ 1,400	\$ 0	\$ 1,400 <u>1/</u>	\$ 600
1998	16,600	0	0	800
1999	0	0	6,400	4,100
2000	0	0	4,800	5,200
2001	0	0	5,400	3,500
2002	0	0	0	2,700
2003	0	0	0	1,100

8. Project Description, Justification and Scope

- 1/ The scope parameters of this project are being reviewed for possible adjustments to meet the programmatic needs of the Defense Program's (DP) Core Stockpile Management, Stockpile Management Restructuring Initiative (SMRI), currently being implemented throughout the DP's Complex within the Department of Energy. The corrective structural over stress repairs and wall reinforcements have been revalidated as supporting both the DP's Strategic Plan and life safety requirements for the Kansas City Plant. The amount of repairs and the specific areas of repairs are being looked at, again, to insure all areas within the footprint of the SMRI are repaired and/or reinforced. The \$1,400,000 appropriated in FY 1997 is on hold pending the outcome of this evaluation.

1. Title and Location of Project: Structural Upgrades, Kansas City Plant,

2a. Project No. 97-D-123

Kansas City, Missouri (Continued)

2b. Construction

Funded

This project is required to correct structural overstress caused by gravity loads and will reinforce masonry walls to resist seismic loading within the DOE controlled portion of the Bannister Federal Complex to ensure life safety. The first part of this line item is required to provide structural overstress relief in accordance with current building code and DOE Order requirements to ensure life safety. This type of overstress is caused by gravity loads (dead loads, live load and snow load) and wind loading only. The structural evaluation is still on-going,

1. Title and Location of Project: Structural Upgrades, Kansas City Plant,
2a. Project No. 97-D-123

Kansas City, Missouri (Continued)

2b. Construction

Funded

8. Project Description, Justification and Scope (Continued)

however, the findings to date indicate that corrective actions are needed to ensure life safety. Overstressed locations will be repaired to reduce the possibility of structural failure and bring the structure into conformance with DOE Orders and codes.

The second part of this line item is required to reinforce masonry walls to resist seismic loading. Approximately 75 percent of the masonry walls in the DOE controlled part of the Federal Complex are not reinforced to resist seismic loading. Seismic codes were not in place when the Kansas City Plant was constructed. Potential seismic overstresses have been identified because of the presence of many unreinforced masonry walls added to the building for fire protection purposes. The structural capacity of these unreinforced walls falls below that of the remaining structure and would fail at an early stage of seismic activity.

The scope parameters of this project are being reviewed for possible adjustments to meet the programmatic needs of the Defense Programs's (DP) Core Stockpile Management, Stockpile Management Restructuring Initiative (SMRI), currently being implemented throughout the DP's Complex within the Department of Energy. The corrective structural over stress repairs and wall reinforcements have been revalidated as supporting both the DP's Strategic Plan and life safety requirements for the Kansas City Plant. The amount of repairs and the specific areas of repairs are being looked at, again, to insure all areas within the footprint of the SMRI are repaired and or reinforced.

Corrective activities will be performed in DOE controlled areas only, unless an item is identified through the engineering study that would affect both DOE and the General Services Administration. This project will include the following upgrades:

- Column ribs will be post tensioned on end bays to increase bending moment capacity. This will be done by tensioning two steel rods underneath the subject ribs. The rods will be anchored into the end bay roof beam and bolted through to the interior roof beam.
- Selected rib ends will be supported with steel suspenders and long threaded rods through the roof shell or saddles and fastened to the roof beams to increase rib shear capacity and overcome the member strength loss due to existing cracking caused by excessive shear loading.
- Roof shell openings will be reinforced with steel straps adjacent to openings and parallel to the barrel axis. This provides a means of externally reinforcing the thin concrete shell.
- The mezzanine roof slab will be reinforced with intermediate steel beams supported by the concrete roof support beams.
- Supplemental support will be provided to mezzanine concrete roof structure integrity. This would stop further deterioration of the shell.
- Roof shell cracks will be injected with epoxy to reestablish roof structure integrity. This would stop further deterioration of the shell.

1. Title and Location of Project: Structural Upgrades, Kansas City Plant,
2a. Project No. 97-D-123

Kansas City, Missouri (Continued)

2b. Construction

Funded

- Structural steel blocking will be attached to the roof structure on each side of existing masonry walls. This will eliminate drift during seismic activity and ultimately failure of the walls independent of the remaining structure. This blocking would be spaced approximately 4 feet center to center. The blocking would consist of steel angles fastened to a horizontal surface with the vertical leg of the angle placed against the top of the masonry wall and flat plates fastened to vertical surfaces of the roof structure and lapped down over the top course of the masonry walls.

1. Title and Location of Project: Structural Upgrades, Kansas City Plant,
2a. Project No. 97-D-123

Kansas City, Missouri (Continued)

2b. Construction

Funded

8. Project Description, Justification and Scope (Continued)

- Steel strong-backs will be installed adjacent to masonry walls. This strong-back will be a structural tube fixed to the building floor at the bottom of the wall and roof structure at the top. The wall would be bolted to the strong-backs at approximately 4 feet centers. The strong-backs themselves would be on 8 foot centers. This would prevent a tall wall from collapse during a seismic event that produced lateral movement normal to the wall.
- The top of free-standing masonry walls will be supported with roof structure mounted braces. These braces would then be mounted to a steel strut fastened to the roof.

On December 16, 1993, a Kansas City Susceptibility Review and Walkdown was held at the Kansas City Plant at Albuquerque Operations Office, and Headquarters offices including the Office of Engineering and Operations Support, Office of Facilities, and Office of Construction and Capital Projects. This review was initiated as a result of the September 1993 report by an outside structural consulting firm that documented two principal areas of concern: existing structural overstresses and numerous unreinforced interior masonry walls. It was determined during the review that the structural overstresses and unreinforced masonry walls findings were an immediate concern as follows:

"First and foremost are the areas of facility structural overstress which pose a failure hazard. Secondly, the extensive amount of unreinforced masonry walls which pose a significant employee (life safety) hazard at very low ground accelerations."

Consequent planning resulted in the incorporation of structural modifications in all ongoing projects which appreciably renovate affected areas to provide an immediate response to initiate risk reduction and potential loss of government assets. These project changes were approved through the baseline change control process. Deficiencies in the remainder of the plant not affected by on-going projects are being addressed in this line item submission.

Gravity overstresses throughout the Kansas City Plant are currently being evaluated. The project is currently scoped and estimated to allow 10 percent overstresses, as allowed per DOE/HQ direction. The data gathered to date reflect the following:

Main Manufacturing Building Overstresses Under Gravity Loading:

- Roof Ribs - 14 percent of the ribs are overstressed.
- Roof Beams - < 1 percent of the beams are overstressed.
- Roof Shell With Openings - 34 percent of the roof shells are overstressed.
- Roof Shell Without Openings - 0 percent.
- Columns - 4 percent of the columns are overstressed. Basement Level Supported Floor Slab - 5 percent of the floor slab is overstressed.
- 2nd Level Supported Floor Slab - 6 percent of the floor slab is overstressed.

1. Title and Location of Project: Structural Upgrades, Kansas City Plant,
2a. Project No. 97-D-123

Kansas City, Missouri (Continued)

2b. Construction

Funded

Seismic events can be generated by two faults. The New Madrid Fault is approximately 250 miles east of the Kansas City Plant. The New Madrid fault system extends 120 miles from the area of Charleston, Missouri and Cairo, Illinois through New Madrid, Missouri and to Marked Tree, Arkansas. It crosses five state lines and crosses the Mississippi River in three places and the Ohio River in two places. The fault is active, averaging more than 200 measured events per year (1.0 or more on the Richter scale), about 20 per month. Tremors large enough to be felt (2.5-3.0 on the Richter scale) are noted annually. Every 18 months the fault releases a shock of 4.0 or more capable of local minor damage. Magnitudes of 5.0 or greater occur about once per decade, can do significant damage, and be felt in several states. A damaging earthquake along the fault of 6.0 or greater reoccurs about every 80 years with the last one in 1895. A major earthquake along the fault of 7.5 or greater happens every 200-300 years, with the last one in 1812. A quake of this magnitude would be felt throughout half of the United States. This

8. Project Description, Justification and Scope (Continued)

information is based on a document titled "About the New Madrid Fault" from Southeast Missouri State University Center for Earthquake Studies, David Stewart, Director. The document is undated.

The other fault that could affect the Kansas City Plant is the Humbolt Fault Zone (Nehemema Ridge) located approximately 80 miles west of Kansas City in the Manhattan-Wamego, Kansas area. The largest earthquake that has occurred in Kansas is a probable Richter magnitude of about 5.2-5.3, which occurred in 1867 and can be expected to occur every 100 years. An earthquake of Richter magnitude 6.0-6.5 at this fault is likely to occur on average once in about 1000 years. This information is based on a document titled "Kansas Geological Survey" from the University of Kansas on October 10, 1990 by Don W. Steeples, Ph.D., Seismologist and Deputy Director.

The structural studies now underway will evaluate the design of the current walls, determine what forces they can be withstand, and evaluate the seismic probabilities from the faults in the areas to determine the corrective actions required. The project is currently scoped to meet the Uniform Building Code. Studies for earthquake to date have shown that the existing masonry walls are inadequate to withstand a low to moderate seismic event and should be reinforced.

The applicable DOE Orders and Codes that apply to this project are as follows:

- DOE Order 5480.28 Natural Phenomena Hazards (NPH) Mitigation Section 10a.(1) Design and Evaluation, which states "An additional objective for selected structures, systems and components (SSC) or site activities is to prevent loss of capability to perform functions consistent with: (1) importance to safety for workers and the public; (2) impact on the environment; (3) repair/replacement costs; (4) programmatic mission. NPR design and evaluation criteria for SSCs for earthquake, wind, flood shall be used for DOE laboratories, reservations, and production facilities."
- Executive Order 12941 "Seismic Safety of Existing Federally Owned or Leased Buildings."
- The American Institute of Steel Construction (A.I.S.C.), American Concrete Institute (A.C.I.), and Uniform Building Code (UBC) define analysis and design requirements for corrective actions.

1. Title and Location of Project: Structural Upgrades, Kansas City Plant,
2a. Project No. 97-D-123

Kansas City, Missouri (Continued)

2b. Construction

Funded

9. Details of Cost Estimate

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 4,065
(1) Engineering design and inspection at approximately 23 percent of construction costs, (Item c (Design, Drawings, and Specifications: \$815)		\$ 2,475
(2) Construction management costs		842
(3) Project management at 7 percent of construction costs (Item c).		748
b. Land and land rights		0
c. Construction costs		10,830
1. Improvements to land		0
2. Building modifications		10,830
3. Special equipment		0
4. Utilities		0
5. Special facilities		0
d. Standard equipment		360
e. Major computer items		0
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout and acceptance		0
h. Subtotal (a through g)		\$ 15,255
i. Contingencies at approximately 18 percent of above costs		<u>2,745</u>
j. Total line item cost (Section 11.a.1.(a))		\$ 18,000
k. LESS: Non-Federal contribution		0
l. Net Federal total estimated cost (TEC)		<u>\$ 18,000</u>

10. Method of Performance

Design and inspection shall be performed under a KCP negotiated architect-engineer contract. Construction will be fixed price contract awarded after competitive proposals and administered by the KCP.

1. Title and Location of Project: Structural Upgrades, Kansas City Plant,

2a. Project No. 97-D-123

Kansas City, Missouri (Continued)

2b. Construction

Funded

11. Schedule of Project Funding and Other Related Funding Requirements

		Prior Years	FY 1997	FY 1998	FY 1999	Outyears
<u>Total</u>						
a. Total project costs						
1. Total facility costs						
4,100	(a) Line item (Section 9.j.)		\$ 0	\$ 600	\$ 800	\$
		\$12,500 \$18,000				
0	(b) Plant, Engineering and Design (PE&D)	0	0	0		
0	(c) Operating Expense funded equipment	0	0	0		
0	(d) Inventories	0	0	0		
0	(e) Total facility cost (Federal and Non-Federal)	\$ 0	\$ 600	\$ 800	\$	
4,100		\$12,500 \$18,000				
2. Other project costs						
0	(a) R&D necessary to complete project	\$ 0	\$ 0	\$ 0	\$	
0	(b) Conceptual design costs	615	0	0		
0	(c) Decontamination and Decommissioning (D&D)	0	0	0		
0	(d) NEPA documentation costs	0	0	0		
0	(e) Other project related costs	200	200	200		
200	(f) Total other project costs	\$ 815	\$ 200	\$ 200	\$	
200	(g) Total project costs	\$ 815	\$ 800	\$ 1,000	\$	
4,300	(h) LESS: Non-Federal contribution	0	0	0		
0	(i) Net Federal total project cost (TPC)	\$ 815	\$ 800	\$ 1,000	\$	
4,300		\$12,885 \$19,800				
b. Related annual costs (estimated life of project--30 years)						
1. Facility operating costs		\$ 0				
2. Facility maintenance and repair costs						

1. Title and Location of Project: Structural Upgrades, Kansas City Plant,
2a. Project No. 97-D-123

Kansas City, Missouri (Continued)

2b. Construction

Funded

..	0	3. Programmatic operating expenses directly related to the facility .	0
..	4. Capital equipment not related to construction but related to the programmatic effort in the facility		
..	5. GPP or other construction related to the programmatic effort in the facility		
..	6. Utility costs		
..	7. Other costs		
..	Total related annual costs		
..			

1. Title and Location of Project: Structural Upgrades, Kansas City Plant,

2a. Project No. 97-D-123

Kansas City, Missouri (Continued)

2b. Construction

Funded

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project funding

1. Total facility costs

(a) Line item -- Construction line item costs for engineering design, procurement, and construction are estimated to be \$18,000,000.

(b) PE&D -- None.

(c) Operating expense funded equipment -- None.

(d) Inventories -- None.

2. Other project costs

(a) R&D necessary to complete construction -- None.

(b) Conceptual design -- Approximately \$615,000 will be incurred to prepare Conceptual Design Report.

(c) Decontamination and Decommissioning (D&D) -- None.

(d) NEPA Documentation -- None.

(e) Other project related funding -- Approximately \$1,185,000 will be expended on other project related items. These costs include pre-Title I activities, construction support, beneficial occupancy inspection, operational readiness reviews, and other activities.

b. Related annual costs

1. Facility operating costs -- None.

2. Facility maintenance and repair costs -- None.

3. Programmatic operating expenses directly related to the facility -- None.

4. Capital equipment not related to construction but related to the programmatic effort of the facility -- None.

5. GPP or other construction related to the programmatic effort -- None.

6. Utility costs -- None.

7. Other Costs -- None.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1.	Title and Location of Project: Nuclear Materials Storage Facility Renovation	2a.
	Project No. 97-D-122	
	Los Alamos National Laboratory, Los Alamos, New Mexico	2b.
	Construction Funded	

SIGNIFICANT CHANGES

- None.

DEPARTMENT OF ENERGY
 FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
 (Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
 (Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

<u>1.</u>		Title and Location of Project:
Nuclear Materials Storage Facility Renovation		2a. Project No. 97-D-122
Los Alamos National Laboratory, Los Alamos, New Mexico		2b. Construction Funded

3a. Date A-E Work Initiated, (Title I Design Start Scheduled):	1st Qtr. FY 1997	5. Previous Cost Estimate:
\$45,292		Total Estimated Cost (TEC) --
3b. A-E Work (Titles I & II) Duration:	28 months	Total Project Cost (TPC) --
\$56,653		

4a. Date Physical Construction Starts:	2nd Qtr. FY 1999	6. Current Cost Estimate:
4b. Date Construction Ends:	2nd Qtr. FY 2001	TEC -- \$45,292
		TPC -- \$56,653

7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1997	\$ 4,000	\$ 0	\$ 4,000	\$ 3,380
1998	41,292	0	9,200	7,495
1999	0	0	15,200	13,767
2000	0	0	12,150	13,767
2001	0	0	4,742	6,883

8. Project Description, Justification and Scope

This project provides necessary renovations to the 84-D-104, Nuclear Materials Storage Facility, an FY 1984 line item project that was not designed or constructed to applicable DOE Order 6430.1A standards and requirements. The Los Alamos Nuclear Materials Storage Facility (NMSF) has never been operational. Funding is required to correct deficiencies in the building discovered after its beneficial occupancy in February 1987.

The NMSF is a multi-level (ground floor, intermediate level and basement) storage vault designed and constructed for long and intermediate term storage of large quantities of special nuclear materials (SNM). In addition to the storage vault, facility support areas include a secure shipping and receiving area, Safe Secure Trailer (SST) vehicle garage and dock, equipment spaces, non-destructive assay (NDA), toilet/change rooms, general storage areas, a freight elevator, and a transfer tunnel to connect NMSF to the existing plutonium facility at TA-55. The entire facility is 30,400 gross square feet. The multi-level hardened vault is approximately 15,700 square feet and contains shipping and receiving, NDA, general storage on the ground level, and an approximately 8,500 square feet SNM vault in the basement. The automated storage and

1. Title and Location of Project: Nuclear Materials Storage Facility Renovation	2a. Project No. 97-D-122
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)	2b. Construction

Funded

retrieval equipment (overhead gantry robot) is controlled by micro-computers connected to the Los Alamos Material Accounting System. General storage for oversized items is also provided in the vault area.

1. Title and Location of Project: Nuclear Materials Storage Facility Renovation	2a. Project No. 97-D-122
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)	2b. Construction

Funded

8. Project Description, Justification and Scope (Continued)

Required modifications to achieve facility operation are as specified below:

- Safeguards and Security Upgrades including Perimeter Intrusion Detection and Assessment System (PIDAS) additions and hardened control point with necessary vestibule areas
- Install new mechanical and electrical equipment
- New High Efficiency Particulate Air (HEPA) Filtered HVAC System
- New Utility building to house natural gas boiler and chillers/pumps
- Reconfiguration of "hardened" structure to establish Material Access Area (MAA)
- Support Area Reconfiguration to prevent co-mingling and establish radiological control point
- Passive Vault Cooling System
- Vault Storage Array Reconfiguration
- Grounding counterpoise system to support sensitive equipment (e.g., alarms, monitors, and NDA)

Project History

- Project was originally constructed as a FY 1984 line item and beneficial occupancy was granted in February 1987
- Facility was never operated due to design and construction deficiencies

The primary purpose of the project is to renovate an existing FY 1984 line item project that has never been operational to comply with DOE Orders 6430.1A and the 5480 series, particularly radiation control and exposure. The NMSF was developed as the central intermediate and long-term storage facility for LANL and is included in LANL's long-range plan. There is no other building at LANL with the storage capacity and protective devices that are available in the NMSF.

DOE has recently assigned weapons surveillance on New Materials Laboratory Testing (NMLT), Stockpile Laboratory Testing (SLT), and Shelf Life Program (SLP) activities from EG&G Rocky Flats Plant to Los Alamos National Laboratory (LANL). Each of these activities will be completed at LANL's PF-4 (TA-55) facility and will require a significant reduction in PF-4 vault holdings to accomplish this added mission. The NMSF, with its tunnel connection to PF-4, is the most advantageous location to move the PF-4 holdings and still keep them close enough to continue on-going plutonium process missions. This action meets the original intent of NMSF, which was to consolidate satellite storage activities throughout LANL to make each satellite's vault available to programmatic requirements.

Engineering studies and the Conceptual Design Report have determined the most cost-effective methodologies to bring the NMSF into compliance with DOE and Federal requirements. Those studies have included radiation protection, heat removal, safeguards and security, HVAC criteria, and hazards analysis. Additionally, operational user requirements and storage criteria have been studied, a comparison of DOE Order 6430.1A criteria to as-built conditions has been conducted and criticality assessments and unshielded radiological dose rate calculations have been made to provide a baseline for additional shielding requirements in the facility. Each of these studies has verified the need for the recommended renovations.

1. Title and Location of Project: Nuclear Materials Storage Facility Renovation	2a. Project No. 97-D-122
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)	2b. Construction

Funded

8. Project Description, Justification and Scope (Continued)

Additional justification for the NMSF renovation is presented as follows:

- The NMSF provides the most cost-effective means to store SNM at LANL. This is attributed to its proximity to PF-4, its large automated storage capacity and its built-in security features which reduce operating costs.
- The NMSF would establish an intermediate to long-term storage facility at LANL, enabling the PF-4 working vault in TA-55 to be used as a working vault: the continued use of the PF-4 working vault for storage of material excess to current activities significantly contributes to radiation exposures among PF-4 vault operations personnel, which is significantly more than the proposed RADCON manual design limits.
- The NMSF provides enhanced safeguards and security for SNM operations (fewer personnel with access to intermediate/long-term storage material, remote handling/access to stored material, SST garage for enclosed loading/unloading activities, a tunnel for material transport to/from TA-55 processing areas, located within an existing Category I Protected Area, etc.).
- Removal of much of the LANL inventory to this storage facility will result in reduced radiation exposure levels.
- This project upgrades vault shielding to current radiological control standards.
- The NMSF provides LANL with the facilities to meet its current missions, support lead laboratory activities, and to support interim storage options for LANL (to address site facility/storage issues) and the DOE (for complex-wide issues).

1. Title and Location of Project: Nuclear Materials Storage Facility Renovation Los Alamos National Laboratory, Los Alamos, New Mexico	2a. Project No. 97-D-122 (Continued)	2b. Construction
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Funded

9. Details of Cost Estimate

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 8,979
(1) Engineering design and inspection at approximately 22.2 percent of construction costs		\$ 6,177
(2) Construction management costs at approximately 4.0 percent of construction costs		1,116
(3) Project management at 6.1 percent of construction costs		1,686
b. Land and land rights		
0		
c. Construction costs		
27,821		
1. Improvements to land		36
2. Buildings		8,942
3. Special equipment		17,965
4. Utilities		96
5. Demolition		782
d. Standard equipment		
651		
e. Major computer items		
0		
f. Removal cost less salvage		
0		
g. Design and project liaison, testing, checkout and acceptance		
0		
h. Subtotal (a through g)		
\$ 37,451		
i. Contingencies at approximately 20.9 percent of above costs		
7,841		
j. Total line item cost (Section 11.a.1.(a)).		
\$ 45,292		
k. LESS: Non-Federal contribution		
0		
l. Net Federal total estimated cost (TEC)		
\$ 45,292		

10. Method of Performance

Design and inspection shall be performed under a negotiated architect or engineer contract. Construction and procurement shall be accomplished by fixed price contracts awarded on the basis of competitive bidding. Procurement of automated storage/retrieval equipment by competition fixed price contract.

11. Schedule of Project Funding and Other Related Funding Requirements

		Prior Years	FY 1997	FY 1998	FY 1999	Outyears
<u>Total</u>						
a. Total project costs						
1. Total facility costs						
\$13,767	(a) Line item (Section 9.j.)	\$20,650	\$45,292	\$ 0	\$ 3,380	\$ 7,495
0	(b) Plant, Engineering and Design (PE&D)	0	0	0	0	0
0	(c) Operating expense funded equipment	0	0	0	0	0
0	(d) Inventories	0	0	0	0	0
0	(e) Total facility cost (Federal and Non-Federal)	\$20,650	\$45,292	\$ 0	\$ 3,380	\$ 7,495
2. Other project costs						
600	(a) R&D necessary to complete project	\$ 4,822		\$ 2,908	\$ 135	\$ 200
0	(b) Conceptual design costs	3,160	3,160		0	0
0	(c) Decontamination and Decommissioning (D&D)	0	0	0	0	0
0	(d) NEPA documentation costs	0	0	0	0	0
0	(e) Other project related costs	1,118	3,379	986	165	100
1,010	(f) Total other project costs	\$ 2,097	\$11,361	\$ 7,054	\$ 300	\$ 300
1,610	(g) Total project costs	\$22,747	\$56,653	\$ 7,054	\$ 3,680	\$ 7,795
\$15,377	(h) LESS: Non-Federal contribution	0	0	0	0	0
0	(i) Net Federal total project cost (TPC)	\$ 7,054	\$ 3,680	\$ 7,795	\$15,377	\$22,747
0		\$ 7,054	\$ 3,680	\$ 7,795	\$15,377	\$22,747
0		\$ 7,054	\$ 3,680	\$ 7,795	\$15,377	\$22,747
b. Related annual costs (estimated life of project--30 years)						
1. Facility operating costs						
0		\$ 4,817				
0	2. Facility maintenance and repair costs	1,276				
0	3. Programmatic operating expenses directly related to the facility					

1. Title and Location of Project: Nuclear Materials Storage Facility Renovation		2a. Project No. 97-D-122
Los Alamos National Laboratory, Los Alamos, New Mexico (Continued)		2b. Construction
Funded		
4.	Capital equipment not related to construction but related to the programmatic effort in the facility	0
5.	GPP or other construction related to the programmatic effort in the facility	0
6.	Utility costs	320
7.	Other costs (Environmental, Waste Management, Security/Safeguards)	963
	Total related annual costs	<u>\$ 7,376</u>

1. Title and Location of Project: Nuclear Materials Storage Facility Renovation	2a. Project No. 97-D-122	
Los Alamos National Laboratory, Los Alamos, New Mexico	(Continued)	2b. Construction

Funded

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

- a. Total project funding
 - 1. Total facility costs
 - (a) Line item -- \$45,292,000.
 - (b) PE&D -- None.
 - (c) Operating expense funded equipment -- None.
 - (d) Inventories -- None.
 - 2. Other project costs
 - (a) R&D necessary to complete construction -- Includes Engineering Studies, thermodynamic modeling, radiation modeling and heat removal studies -- \$4,822,000.
 - (b) Conceptual design -- Includes Functional and Operational Requirements, Conceptual Design Reports, Construction Project Data Sheets and Value Engineering activities: Preliminary Safety Analysis Report, Safety Analysis Report, Operational Readiness Review and startup activities. Many activities included in this cost category were begun in FY 1994 -- \$3,160,000.
 - (c) Decontamination and Decommissioning (D&D) -- None.
 - (d) NEPA documentation -- None.
 - (e) Other project related funding -- NEPA documentation, includes Sitewide EIS support -- \$3,379,000.
- b. Related annual costs
 - 1. Facility operating costs -- This activity covers all staffing activities -- \$4,817,000.
 - 2. Facility maintenance and repair costs -- Approximately \$1,276,000 per year for repair and replacement costs.
 - 3. Programmatic operating expenses directly related to the facility -- \$0 per year.
 - 4. Capital equipment not related to construction but related to the programmatic effort of the facility -- None.
 - 5. GPP or other construction related to the programmatic effort -- None.
 - 6. Utility costs -- \$320,000 per year.
 - 7. Other Costs -- \$963,000 related to Environmental/Waste Management, Security/Safeguards.

DEPARTMENT OF ENERGY
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(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1.	Title and Location of Project: Consolidated Pit Packaging System (CPPS) AT-400A	2a.
	Project No. 97-D-121	
	Pantex Plant, Amarillo, Texas	2b.
	Construction Funded	

SIGNIFICANT CHANGES

- The project is not needed to meet the mission requirements of the Stockpile Management Program, including any future relocation of AT-400A packaging lines to Building 12-116, and it has been cancelled.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

<p>1. Consolidated Pit Packaging System (CPPS) AT-400A Pantex Plant, Amarillo, Texas</p> <p>2b. Construction Funded</p> <p>-----</p> <p>3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 1st Qtr. FY 1997</p> <p>7,310</p> <p>3b. A-E Work (Titles I & II) Duration: 8 months</p> <p>\$20,550</p> <p>-----</p> <p>4a. Date Physical Construction Starts: 4th Qtr. FY 1997</p> <p>4b. Date Construction Ends: 3rd Qtr. FY 1998</p>	<p>Title and Location of Project: 2a. Project No. 97-D-121</p> <p>-----</p> <p>5. Previous Cost Estimate: Total Estimated Cost (TEC) -- \$</p> <p>Total Project Cost (TPC) --</p> <p>-----</p> <p>6. Current Cost Estimate: TEC -- \$ 7,310 TPC -- \$20,550</p>
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7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1997	\$ 870 <u>1</u> /	\$ 0	\$ 0	\$ 0
1998	0	0	0	0

8. Project Description, Justification and Scope

This project consists of the design, development, production, and installation of the Consolidate Pit Packaging System (CPPS) and the design and construction necessary to support the modifications of the Special Nuclear Material Component Staging Facility (SNMCSF), Building 12-116 to house the CPPS. Modifications to the SNMCSF rooms 146, 147, and 148 will include upgrades to the utility, lighting, and Heating Ventilation and Air Conditioning (HVAC) systems.

Programmatic need for this project will be satisfied by modification of existing facilities and installing two pit packaging lines in Building 12-99; therefore, the project is being cancelled.

1/ The project is not needed to meet the mission requirements of the Stockpile Management Program, including any future relocation of AT-400A packaging lines to Building 12-116, and it has been cancelled.

1. Title and Location of Project: Consolidated Pit Packaging System (CPPS) AT-400A Pantex Plant, Amarillo, Texas (Continued)	2a. Project No. 97-D-121 2b. Construction
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9. Details of Cost Estimate 2/3/

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 1,330
(1) Engineering design and inspection at approximately 31 percent of construction costs		\$ 380
(2) Construction management costs at approximately 21 percent of construction costs (Item c)		260
(3) Project management costs at approximately 23% of construction costs (Item c)		290
(4) Preliminary Safety Analysis Report (PSAR)		120
(5) Final Safety Analysis Report (FSAR)		280
b. Land and land rights		
0		
c. Construction costs		
1,220		
1. Improvements to land (temporary security fencing)		80
2. Building		900
3. Special equipment		0
4. Other structures		0
5. Installation of capital equipment		240
d. M&O contractor construction support		
60 <u>4/</u>		
e. Capital equipment		
3,520		
f. Major computer items		
0		
g. Removal cost less salvage		
0		
h. Design and project liaison, testing, checkout and acceptance		
<u>0</u>		
i. Subtotal (a through h)		
\$ 6,130		
j. Contingencies at approximately 19 percent of above costs.		
<u>1,180</u>		

2/ This estimate is based on the Conceptual Design Report dated July 1995.

3/ Costs have been escalated as follows for each portion of the project: ED&I - 6.072% (January 1997); CM/PM - 9.572% (January 1998); Construction - 9.572% (January 1998); Equipment - 9.572% (January 1998). Escalation is based on USDOE/HQ/PR-25/COND Guidelines dated September 1, 1994.

4/ This entry represents M&H Craft Support of the Contractor (barricade erection, x-raying walls etc.).

1. Title and Location of Project: Consolidated Pit Packaging System (CPPS) AT-400A Pantex Plant, Amarillo, Texas (Continued)	2a. Project No. 97-D-121 2b. Construction
---	--

Funded

k.	Total line item cost (Section 11.a.1.(a)).	
	\$ 7,310	
l.	LESS: Non-Federal contribution	
	<u>0</u>	
m.	Net Federal total estimated cost (TEC)	
	<u>\$ 7,310</u>	

10. Method of Performance

Contracting arrangements are as follows: (a) design, procurement and construction: fixed-price contract awarded on the basis of competitive bidding.

1. Title and Location of Project: Consolidated Pit Packaging System (CPPS) AT-400A
Pantex Plant, Amarillo, Texas (Continued)

2a. Project No. 97-D-121
2b. Construction

Funded

11. Schedule of Project Funding and Other Related Funding Requirements

		Prior Years	FY 1997	FY 1998	FY 1999	Outyear
<u>Total</u>						
a. Total project costs						
1. Total facility costs						
(a) Line item (Section 9.j.)	\$ 0	\$ 0	\$ 820	\$ 6,490	\$	
	\$ 7,310					
(b) Plant, Engineering and Design (PE&D)	0	0	0	0		
(c) Operating expense funded equipment	0	0	0	0		
(d) Inventories	0	0	0	0		
(e) Total facility cost (Federal and Non-Federal)	\$ 0	\$ 0	\$ 820	\$ 6,490	\$	
2. Other project costs						
(a) R&D necessary to complete project	\$ 4,860	\$ 2,960	\$ 2,560	\$		
(b) Conceptual design costs	150	0	0			
(c) Decontamination and decommissioning (D&D)	0	0	0	0		
(d) NEPA documentation costs	0	0	0	0		
(e) Other project related costs	270	150	910			
(f) Total other project costs	\$ 5,280	\$ 3,110	\$ 3,470	\$		
(g) Total project costs	\$ 5,280	\$ 3,930	\$ 9,960	\$		
(h) LESS: Non-Federal contribution	0	0	0			
(i) Net Federal total project cost (TPC)	\$ 5,280	\$ 3,930	\$ 9,960	\$		
b. Related annual costs (estimated life of project--20 years)						
1. Facility operating costs						
2. Facility maintenance and repair costs						
3. Programmatic operating expenses directly related to the facility						

1. Title and Location of Project: Consolidated Pit Packaging System (CPPS) AT-400A		2a. Project No. 97-D-121
Pantex Plant, Amarillo, Texas (Continued)		2b. Construction
Funded		
		769
4. Capital equipment not related to construction but related to the programmatic effort in the facility		
. .	0	
5. GPP or other construction related to the programmatic effort in the facility		
. .	0	
6. Utility costs		
. .	23	
7. Other costs		
. .	0	
Total related annual costs		
. .	<u>\$ 1,125</u>	

1. Title and Location of Project: Consolidated Pit Packaging System (CPPS) AT-400A
Pantex Plant, Amarillo, Texas (Continued)

2a. Project No. 97-D-121
2b. Construction

Funded

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project funding

1. Total facility costs

- (a) Line item -- \$7,310,000.
- (b) PE&D -- None.
- (c) Operating expense funded equipment -- None.
- (d) Inventories -- None.

2. Other project costs

- (a) R&D necessary to complete construction -- The \$11,680,000 includes Sandia National Laboratories cost to develop automated robotics equipment, MHSM vacuum technology development, and retooling costs for the pit packaging process.
- (b) Conceptual design -- The \$150,000 includes costs for conceptual design report and project management plan and NEPA documentation preparation.
- (c) Decontamination and decommissioning (D&D) -- There are no decontamination or decommissioning costs associated with this project.
- (d) NEPA documentation costs -- Includes preparation and review of NEPA checklist. Costs are included in conceptual design.
- (e) Other project related funding -- The \$1,410,000 includes planning, design criteria preparation, A-E selection, preparation and the conduct of an Operational Readiness Review, startup and training.

b. Related annual costs

- 1. Facility operating costs -- Included in programmatic operating expenses directly related to the project.
- 2. Facility maintenance and repair costs -- Routine maintenance will be performed by Pantex Plant craftsmen dedicated to this project at an estimated cost of \$333,000.
- 3. Programmatic operating expenses directly related to the facility -- Approximately \$769,000 will include 10 production technicians, one supervisor and one engineer working normal 40 hour weeks. Total operating FTE's are based on a 20 year period, which will be considerably less than the first five years of operation, when 14 technicians and one supervisor will be required.
- 4. Capital equipment not related to construction but related to the programmatic effort of the facility -- There are no capital equipment costs, not related to construction, that are related to the programmatic effort of the project.
- 5. GPP or other construction related to the programmatic effort -- There are no maintenance, repair, GPP or other construction costs related to the programmatic effort of the project.
- 6. Utility costs -- Costs consists of the cost of electricity required for the project estimated at \$23,000.
- 7. Other Costs -- None.

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DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project:Retrofit HVAC and Chillers for Ozone Protection	2a. Project No. 96-D-123
Oak Ridge Y-12 Plant, Oak Ridge, Tennessee	2b Construction Funded

SIGNIFICANT CHANGES

- None.

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 (Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
 (Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project: Protection,	Retrofit HVAC and Chillers for Ozone Project No.: 96-D-123
2a. Oak Ridge Y-12 Plant, Oak Ridge, Tennessee	2 b .
Construction Funded	

3a. Date A-E Work Initiated (Title I Design Start Scheduled): 1st Qtr. FY 1996	5. Previous Cost Estimate: Total Estimated Cost (TEC) -- \$13,600
3b. A-E Work (Titles I and II) Duration: 8 months	Total Project Cost (TPC) -- \$14,500

4a. Date Physical Construction Starts: 1st Qtr. FY 1997	6. Current Cost Estimate: TEC -- \$12,800 <u>1</u> /
4b. Date Construction Ends: 4th Qtr. FY 1998	TPC -- \$13,700 <u>a</u> /

7. Financial Schedule (Federal Funds):

Fiscal Year	Appropriations	Adjustments	Obligations	Costs
1996	\$ 3,100	\$ 0	\$ 3,100	\$ 371
1997	7,000	0	7,000	5,200
1998	2,700	0	2,700	7,229

8. Project Description, Justification and Scope

This project will eliminate the use of "ozone depleting" chlorofluorocarbons (CFCs) currently used in the refrigeration and cooling systems at the Y-12 Plant, by replacing chillers and direct expansion (DX) air conditioners with new equipment and retrofitting existing chillers, DX units, and process coolers to operate on "ozone friendly" refrigerants. It will also upgrade the ventilation systems in chiller buildings and construct a small covered storage area to store CFC refrigerants removed from the affected chillers.

* FY 1998 funds will be used for procurement and construction activities.

After 1995 the refrigerant used in the existing chillers will not be manufactured. After refrigerant stockpiles are depleted, these chillers cannot operate, resulting in the loss of cooling in each and every building on the system. Government

1/ The revised total estimated cost (TEC) and total project cost (TPC) are based on pending Baseline Change Proposal 73/CHILLERS-02.

1. Title and Location of Project:	Retrofit HVAC and Chillers for Ozone
Protection,	Project No.: 96-D-123
2a.	2
Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (Continued)	b
Construction Funded	.

procurement guidelines prohibit stockpiling of refrigerant and caps are placed on the amount of refrigerant that can be procured.

The Retrofit HVAC and Chillers for Ozone Protection project will ensure that required comfort and process cooling continues in buildings at the Y-12 Plant. Most of the cooling in Y-12 is performed by central chilled water systems utilizing chillers that operate below atmospheric pressure. These chillers utilize automatic purge units to discharge moisture and air which enters the refrigerant circuit because of the low pressure. These purge units also discharge refrigerant while purging the moisture and air. Although these chillers will be retrofitted with new high-efficiency purge units that discharge less than one-half pound of refrigerant per pound of air (existing units purge 3 pounds of refrigerant per pound of air), they will still discharge refrigerant to the atmosphere during normal operation. This project is necessary to minimize atmospheric emissions

1. Title and Location of Project:	Retrofit HVAC and Chillers for Ozone
Protection,	Project No.: 96-D-123
2a. Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (Continued)	2 b .
Construction Funded	

8. Project Description, Justification and Scope (Continued)

and eliminate the use of ozone depleting CFCs to insure compliance with the EPA Stratospheric Ozone Protection Amendment of the Clean Air Act, the Montreal Protocol, the Department of Energy (DOE) Order 5400.1, General Environmental Protection Program, and Title 40 of the Federal Regulations. The project will also comply with the Presidential Executive Order 12856 for Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements of 1993, the National Pollution Prevention Act of 1990, and the National Energy Policy Act of 1992.

9. Detail of Cost Estimate 2/

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs	\$	2,160
(1) Engineering design and inspection costs at approximately 15 percent of construction (Item c)		\$ 1,355
(2) Construction management costs	320	
(3) Project management costs	485	
b. Land and land rights		0
c. Construction costs		8,325
1. Improvements to land	0	
2. Buildings	0	
3. Special equipment	0	
4. Utilities	8,325	
5. Demolition	0	
d. Standard equipment		0
e. Major computer items		0
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout, and acceptance		150
h. Subtotal (a through g)	\$ 10,635	
i. Contingencies at approximately 20 percent of above costs		2,165
j. Total line item cost (Section 11.a.1.(a))	\$ 12,800	3/
k. LESS: Non-Federal contribution		0
l. Net Federal total estimated cost (TEC)	\$ 12,800	1/

2/ These estimates are based on a conceptual design completed November 1993.

3/ Applicable escalation rates are taken from the DOE Oak Ridge Operations escalation multipliers issued October 1993. The escalation rates were based on escalation of 3.4 percent in FY 1996 and 3.3 percent after FY 1996.

1/ The revised total estimated cost (TEC) and total project cost (TPC) are based on pending Baseline Change Proposal 73/CHILLERS-02.

1. Title and Location of Project:	Retrofit HVAC and Chillers for Ozone
Protection,	Project No.: 96-D-123
2a. Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (Continued)	2 b .
Construction Funded	

10. Method of Performance

To the extent feasible engineering will be performed under a negotiated fixed-fee architect-engineer contract. To the extent feasible construction will be accomplished with a construction manager using fixed-price subcontractors. Advanced procurement of new chillers and air conditioners (long delivery items) will be by the construction manager.

11. Schedule of Project Funding and Other Related Funding Requirements

	<u>FY 1998</u>	<u>Prior Years</u>	<u>Total</u>	<u>FY 1996</u>	<u>FY 1997</u>
a. Total project costs					
1. Total facility costs					
(a) Line item (Section 9.j.)		\$ 0	\$ 371	\$ 5,200	\$ 7,229
(b)	PE&D		0	0	0
0					
(c)			Operating expense funded equipment		
0 0 0 0					0
(d)			Inventories		
0				0	0
0				0	0
(e) Total facility cost (Federal and Non-Federal)		\$ 0	\$ 371	\$ 5,200	\$ 7,229
2. Other project costs					
(a)			R&D necessary to complete project		
0 0 0 0					0
(b) Conceptual design costs		195	0	0	0
(c)			Decontamination & Decommissioning (D&D)		
0 0 0 0					195
(d) NEPA documentation costs		5	0	0	0
(e) Other project related costs		240	190	135	135
(f) Start-up costs		0	0	0	0
(g) Total other project costs		\$ 440	\$ 190	\$ 135	\$ 135
(h)				\$ 440	\$ 561
\$ 5,335					
(i)			Total project costs .		
0			\$ 7,364	\$ 13,700	
(j)			LESS: Non-Federal contribution		
0			0	0	0
0			Net Federal total project costs (TPC)		
\$ 440			\$ 561	\$ 5,335	\$ 7,364
			\$ 13,700		
b. Related annual costs (estimated life of project--25 to 40 years)					
1. Facility operating costs					\$ 500
2. Facility maintenance and repair costs					600
3. Programmatic operating expenses directly related to the facility					0

1. Title and Location of Project:	Retrofit HVAC and Chillers for Ozone
Protection,	Project No.: 96-D-123
2a.	2 b .
Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (Continued)	
Construction Funded	

4.	Capital equipment not related to construction but related to the programmatic effort in the facility	950
5.	GPP or other construction related to the programmatic effort in the facility	0
6.	Utility costs	4,600
7.	Other costs	0
	Total related annual costs	<u>\$ 6,650</u>

1. Title and Location of Project: Retrofit HVAC and Chillers for Ozone Protection, Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No.: 96-D-123 2b. Construction Funded
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12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

- a. Total project funding
 - 1. Total facility costs
 - (a) Line item -- Costs for the design, procurement, and construction to retrofit HVAC systems and chillers for ozone protection are estimated to be \$12,800,000.
 - (b) PE&D -- None.
 - (c) Operating expense funded equipment -- None.
 - (d) Inventories -- None.
 - 2. Other project costs
 - (a) R&D necessary to complete construction -- None.
 - (b) Conceptual design -- The conceptual design was completed November 1993 at a cost of \$195,000.
 - (c) Decontamination & Decommissioning (D&D) -- None.
 - (d) NEPA documentation -- Cost of 1994 categorical exclusion (CX) preparation \$5,000.
 - (e) Other project related costs -- Engineering and operational support activities for Y-12 Plant functions during design and construction will cost approximately \$700,000.
 - (f) Start-up costs -- None.
- b. Related annual costs
 - 1. Facility operating costs -- Includes utilities personnel 3 shifts are approximately \$500,000.
 - 2. Facility maintenance and repair costs -- Keep chillers and HVAC equipment operational are approximately \$600,000.
 - 3. Programmatic operating expenses directly related to facility materials (Programmatic Support) -- None.
 - 4. Capital equipment not related to construction but related to the programmatic effort in the facility -- Capital equipment to install high efficiency purge units and prevac heaters on existing chiller units will cost approximately \$950,000. This equipment will reduce refrigerant leakage from existing chillers as an interim corrective action until line item is funded.
 - 5. GPP or other construction related to the programmatic effort in the facility -- None.
 - 6. Utility costs -- Electricity costs approximately \$4,600,000 to operate the chillers and HVAC equipment.
 - 7. Other costs -- None.

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DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project:Sewage Treatment Quality Upgrade (STQU), Pantex Plant, Amarillo, Texas	2a.Project No. 96-D-122 2b.Construction Funded
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SIGNIFICANT CHANGES

- None.

DEPARTMENT OF ENERGY
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DEFENSE ASSET ACQUISITION
 (Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Sewage Treatment Quality Upgrade (STQU), Pantex Plant, Amarillo, Texas		Title and Location of Project: 2a. Project No. 96-D-122 2b. Construction Funded
3a. Date A-E Work Initiated, (Title I Design Start Scheduled): 2nd Qtr. FY 1996 \$11,300		5. Previous Cost Estimate: Total Estimated Cost (TEC) --
3b. A-E Work (Titles I & II) Duration: 25 months \$12,400		Total Project Cost (TPC) --
4a. Date Physical Construction Starts: 2nd Qtr. FY 1998		6. Current Cost Estimate: TEC -- \$ 11,300
4b. Date Construction Ends: 2nd Qtr. FY 2001		TPC -- \$ 12,400

7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1996	\$ 600	\$ 0	\$ 600	\$ 6
1997	100	0	100	300
1998	10,600	0	6,900	5,700
1999	0	0	3,700	4,400
2000	0	0	0	500
2001	0	0	0	394

8.

Project Description, Justification and Scope

The Sewage Treatment Quality Upgrade (STQU) project will control and process liquid from industrial processes, storms, and raw sewage. The Sewer System Upgrade subproject will repair and replace existing deteriorated sanitary sewer lines in Zone 12, eliminate industrial process discharges to surface ditches, and manage the plant storm water.

The STQU project will control and process liquid from industrial processes, stormwater run-off, and sanitary wastewater. The project consists of four major parts: (1) Upgrade the existing sanitary sewer treatment system; (2) repair and/or replace sanitary sewage collection lines in Zone 12; (3) eliminate industrial discharges from three buildings to the stormwater system; and (4) control contamination from stormwater run-off from paved parking areas.

The wastewater treatment system will be upgraded to meet know and anticipated environmental regulations. Improvements include: replace existing manual bar screen with an automatic mechanical bar screen; convert the existing lagoon into two

1. Title and Location of Project: (STQU),	2a. Pantex Plant, Amarillo, Texas (Continued)	Sewage Treatment Quality Upgrade Project No.: 96-D-122 2b.
Construction Funded		

basins, one for flow equalization and one for excess sludge storage; design and construct a new multi-channel oxidation ditch wastewater treatment system; install secondary clarifiers; install ultraviolet light disinfection system; design and install a tertiary sand filtration system with liquid alum addition to control phosphates in the effluent; and provide necessary connecting piping and pump stations.

8. Project Description, Justification and Scope (Continued)

The older sanitary sewage collection lines at Pantex have mostly been replaced under the Utilities Restoration program and under the Sanitary Sewer Renovation subproject of the ES&H Enhancements Line item. It is proposed that the remaining older lines, primarily in the north central part of Zone 12 be replaced under this project. The lines and manholes will be replaced if necessary, or repaired and sliplined if feasible.

Industrial wastewater from Buildings 12-19, 11-20 and 11-50 are currently being discharged to the stormwater drainage system after first being filtered of the major contaminants. This project will provide improvements to the filtration system, provide a holding tank where the water can be tested for the level of chemical contaminants, and connect the discharge of the holding tanks to the sanitary sewer system.

This project will provide for the control of contaminants that might be washed from paved areas to the stormwater drainage system.

FY 1998 funds will be used for design, procurement and construction activities.

1. Title and Location of Project:	Sewage Treatment Quality Upgrade
(STQU),	Project No.: 96-D-122
2a. Pantex Plant, Amarillo, Texas (Continued)	2b.
Construction Funded	

9. Details of Cost Estimate a/b/

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 1,700
(1) Engineering design and inspection at approximately 9.7 percent of construction costs (Item c) (Includes PSAR/FSAR)		\$ 750
(2) Construction management at 11 percent of construction costs (Item c)		820
(3) Project management at 1.7 percent of construction costs		130
b. Land and land rights		0
c. Construction costs		7,700
1. Improvements to land including grading, drainage, paving, parking, fencing, lighting, pedestrian access walks		1,110
2. Buildings (Waste Water Treatment Plant Support Buildings, Addition to Building 12-19)		3,860
3. Special equipment		0
4. Utilities, including electrical power, water, sanitary sewer lines, compressed air, fuel oil, condensate return lines, etc.		2,710
5. Demolition		0
6. M&O contractor construction support		20
d. Standard equipment		0
e. Major computer items		0
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout and acceptance		0
h. Subtotal (a through g)		9,400
i. Contingencies at approximately 20.2 percent of above costs		1,900
j. Total line item cost (Section 11.a.1.(a)).		

a/ This estimate is based on the Conceptual Design Report, which is 100 percent complete. Total costs have been rounded to the nearest hundred thousand.

b/ Costs have been escalated as follows for each portion of the project: Building ED&I 8.980 percent (December 1996); CM/PM 15.360 percent (September 1998); Construction 14.430 percent (June 1998), Equipment (not applicable). Escalation is based on ICE/CCMD/HQ Guidelines.

1. Title and Location of Project:	Sewage Treatment Quality Upgrade
(STQU),	Project No.: 96-D-122
2a. Pantex Plant, Amarillo, Texas (Continued)	2b.
Construction Funded	

\$ 11,300

k. LESS: Non-Federal contribution

0

l. Net Federal total estimated cost (TEC)

\$ 11,300

10. Method of Performance

Contracting arrangements are as follows: design, procurement and construction - fixed-price contract awarded on the basis of competitive bidding.

1. Title and Location of Project:
(STQU), 2a.
Pantex Plant, Amarillo, Texas (Continued)
Construction Funded

Sewage Treatment Quality Upgrade
Project No.: 96-D-122
2b.

11. Schedule of Project Funding and Other Related Funding Requirements

	<u>Prior Years</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Outyear</u>	<u>Total</u>
a. Total project costs							
1. Total facility costs							
\$ 11,300 (a) Line item (Section 9.j.)		\$ 0	\$ 6	\$ 300	\$ 5,700	\$ 4,400	\$ 994
0 (b) Plant, Engineering and Design (PE&D).		0		0	0	0	0
(c) Operating expense funded equipment .		0	0	0	0	0	0
0 (d) Inventories		<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
(e) Total facility cost (Federal and Non-Federal).		\$ 0	\$ 6	\$ 300	\$ 5,700	\$ 4,400	\$ 994
\$ 11,300 2. Other project costs							
\$ 0 (a) R&D necessary to complete project . .		\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0
500 (b) Conceptual design costs		500		0	0	0	0
0 (c) Decontamination & Decommissioning (D&D).		0	0	0	0	0	0
100 (d) NEPA documentation costs		100		0	0	0	0
500 (e) Other project related costs		<u>0</u>	<u>0</u>	<u>0</u>	<u>100</u>	<u>100</u>	<u>300</u>
\$ 1,100 (f) Total other project costs		\$ <u>600</u>	\$ <u>0</u>	\$ <u>0</u>	\$ <u>100</u>	\$ <u>100</u>	\$ <u>300</u>
\$ 12,400 (g) Total project costs		\$ 600	\$ 6	\$ 300	\$ 5,800	\$ 4,500	\$ 1,194
0 (h) LESS: Non-Federal contribution . . .		\$ <u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
\$ 12,400 (i) Net Federal total project cost. . .		\$ <u><u>600</u></u>	\$ <u><u>6</u></u>	\$ <u><u>300</u></u>	\$ <u><u>5,800</u></u>	\$ <u><u>4,500</u></u>	\$ <u><u>1,194</u></u>
b. Related annual costs (estimated life of project--25 years)							
1. Facility operating costs							
. . . . \$ 1,200							
2. Facility maintenance and repair costs							
. . . .							

1. Title and Location of Project:		Sewage Treatment Quality Upgrade
(STQU),	2a.	Project No.: 96-D-122
	Pantex Plant, Amarillo, Texas (Continued)	2b.
Construction Funded		
3.	Programmatic operating expenses directly related to the facility	0
4.	Capital equipment not related to construction but related to the programmatic effort in the facility	0
5.	GPP or other construction related to the programmatic effort in the facility	0
6.	Utility costs	100
7.	Other costs	0
	Total related annual costs.	
	\$ <u>1,400</u>	

1. Title and Location of Project: (STQU),	2a. Pantex Plant, Amarillo, Texas (Continued)	Sewage Treatment Quality Upgrade Project No.: 96-D-122 2b.
Construction Funded		

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project funding

1. Total facility costs

- (a) Line item -- \$11,300,000.
- (b) PE&D -- None.
- (c) Operating expense funded equipment -- None.
- (d) Inventories -- None.

The facility cost is the only direct cost related to this project. There are no operating expense funded equipment and no inventories associated with the project.

2. Other project costs

- (a) R&D necessary to complete construction -- None.
- (b) Conceptual design -- \$500,000.
- (c) Decontamination and Decommissioning (D&D) -- None.
- (d) NEPA documentation -- \$100,000.
- (e) Other project related funding -- Costs are engineering support for preoperational test, checkout and startup--

\$500,000.

b. Related annual costs

It is estimated that the facility will be used 25 years for its programmatic purpose.

- 1. Facility operating costs -- The major elements comprising the annual operating costs are for energy costs, labor costs, and operating costs of mechanical equipment. To operate the facility, fourteen operators on a one shift rotation will be required -- \$1,200,000.
- 2. Facility maintenance and repair costs -- Routine maintenance will be completed by the Pantex Plant craftsmen -- \$100,000.
- 3. Programmatic operating expenses directly related to the facility -- None.
- 4. Capital equipment not related to construction but related to the programmatic effort in the facility -- None.
- 5. GPP or other construction related to programmatic effort -- None.
- 6. Utility costs -- \$100,000.
- 7. Other Costs -- None.

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DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project:Sanitary Sewer Upgrade	2a Project No. 95-D-122
Oak Ridge Y-12 Plant, Oak Ridge, Tennessee	2b Construction Funded

SIGNIFICANT CHANGES

- The total estimated cost (TEC) was increased from \$26,300,000 to \$32,000,000 and total project cost (TPC) increased from \$27,800,000 to \$33,500,000 due to increase in line rehabilitation and controls for mercury contamination. This change also results in project completion date being extended by 9 months to June 1999 as a result of pipe repair length increase from 15,000 linear feet (lf) to 21,000 lf based on video survey. Mercury contamination was identified and cleanup was added scope to the project.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project:	Sanitary Sewer Upgrade
2a. Project No.: 95-D-122	
Oak Ridge Y-12 Plant, Oak Ridge, Tennessee	2b.
Construction Funded	

3a. Date A-E Work Initiated (Title I Design Start Scheduled): 1st Qtr. FY 1995	5. Previous Cost Estimate:
	Total Estimated Cost (TEC) \$26,300
3b. A-E Work (Titles I & II) Duration: 18 months	Total Project Cost (TPC) \$27,800

4a. Date Physical Construction Starts: 1st Qtr. FY 1996	6. Current Cost Estimate:
	TEC -- \$32,000
4b. Date construction ends: 3rd Qtr. FY 1999	TPC -- \$33,500

7. Financial Schedule (Federal Funds):

Fiscal Year	Appropriations	Adjustments	Obligations	Costs
1995	\$ 2,200	\$ 0	\$ 2,200	\$ 505
1996	6,300	0	6,300	4,170
1997	10,900	0	10,900	6,000
1998	12,600	0	12,600	14,000
1999	0	0	0	7,325

8. Project Description, Justification and Scope

The TEC was increased from \$26,300,000 to \$32,000,000; the length of lines to be repaired increased from 15,000 feet to approximately 21,000 feet; and the construction completion date was extended from the 4th Qtr. FY 1998 to the 3rd Qtr. FY 1999 as a result of pipe repair length increase from 15,000 linear feet (lf) to 21,000 lf based on video survey. Mercury contamination was identified and cleanup was added scope to the project.

This project will address upgrades to the existing Oak Ridge Y-12 Plant sanitary sewer system. The objective of the project is to repair known system deficiencies, which have resulted in outages and stoppages, sanitary waste water pollution entering the storm sewer system and East Fork Poplar Creek (EFPC), and a steadily increasing amount of surface water and ground water entering the sanitary system by inflow and infiltration. This project is infrastructure related and will be required regardless of the future missions at the Y-12 Plant.

* FY 1998 funds will be used for procurement and construction activities.

The project is needed for several reasons. First, as a result of the present sanitary sewer system deficiencies (particularly blocked piping and pump station breakdowns), overflows of waste water periodically occur into Y-12 Plant building plumbing services, causing disruptions of operations in both radiological and nonradiological areas. This

1. Title and Location of Project:	Sanitary Sewer Upgrade
2a. Project No.: 95-D-122	
Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (Continued)	2b.
Construction Funded	

project will correct these deficiencies, thereby preventing the overflows and subsequent disruptions. Second, due to piping and manhole deficiencies, surface water and ground water enter the sanitary sewer system and is conveyed to the City of Oak Ridge treatment system. The entry of such waters into the system represents a noncompliance with the city's sewer

1. Title and Location of Project:	Sanitary Sewer Upgrade
2a. Project No.: 95-D-122	
Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (Continued)	2b.
Construction Funded	

8. Project Description, Justification and Scope (Continued)

use ordinance, which prohibits such discharges into the system. This project will prevent surface water and ground water inflows into the system by performing piping and manhole repairs. Third, cross-connections exist between the sanitary sewage system and storm sewer system, which results in pollution from the sanitary sewage system entering the storm sewer system and into EFPC. This unauthorized bypass of the sewage system into EFPC, which is in violation of the CWA, will be addressed in the project by the elimination of the cross-connections. Fourth, sanitary sewer lines, particularly those in the western half of the Y-12 Plant, are operating at their capacity and, hence, are inadequate to handle expected additional sanitary waste water flows from ongoing facility construction. The proposed sewer upgrade project will replace affected lines with larger piping to support the ongoing facility construction.

The scope of the project consists of repairing approximately 300 manholes, rehabilitating approximately 21,000 feet of deteriorated sewer line by drainage bursting, replacing and other techniques as appropriate, decommissioning one pump station and relocating a second pump station, and eliminating cross-connections between the sanitary sewer system and storm sewer system, and implementing contamination controls and clean-up for existing mercury contamination released by construction activities.

9. Detail of Cost Estimate a/

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs	\$ 6,950	
(1) Engineering design and inspection at approximately 18.5 percent of construction costs, (Item c)	\$ 3,500	
(2) Construction management costs at approximately 10 percent of construction costs . . .	1,900	
(3) Project management at approximately 8 percent of construction costs	1,550	
b. Land and land rights	0	
c. Construction costs	18,980	
1. Improvements to land	0	
2. Buildings	0	
3. Special equipment	0	
4. Utilities	18,980	
5. Demolition	0	
d. Standard equipment	0	
e. Major computer items	0	
f. Removal cost less salvage	0	
g. Design and project liaison, testing, checkout and acceptance	980	
h. Subtotal (a through g)	\$26,840	
i. Contingencies at approximately 19.2 percent of above costs	5,160	

a/ These estimates are based on a conceptual design completed in February 1993 and approved BCP AL96024.

1. Title and Location of Project:	Sanitary Sewer Upgrade
2a. Project No.: 95-D-122	2b.
Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (Continued)	
Construction Funded	

j. Total line item cost (Section 11.a.1.(a))	\$32,000 b/
k. LESS: Non-Federal contribution	0
l. Net Federal total estimated cost (TEC)	<u>\$32,000</u>

10. Method of Performance

To the extent feasible, engineering will be performed under a negotiated architect-engineer contract. To the extent feasible, construction and procurement will be accomplished with a construction manager using fixed-price subcontractors.

11. Schedule of Project Funding and Other Related Funding Requirements

	Prior Years FY 1998	FY 1996 FY 1999	FY 1997 Total	
a. Total project costs				
1. Total facility costs				
(a) Line item (Section 9.j.)	\$ 505	\$ 4,170	\$ 6,000	\$ 14,000 \$ 7,325
\$ 32,000				
(b) Plant, Engineering and Design (PE&D)	0	0	0	0
0				
(c) Operating expense funded equipment	0	0	0	0
0				
(d) Inventories	0	0	0	0
0				
Total facility cost (Federal and Non-Federal) \$	505	\$ 4,170	\$ 6,000	\$ 14,000 \$ 7,325 \$ 32,000
2. Other project costs				
(a) R&D necessary to complete project	\$ 0	\$ 0	\$ 0	\$ 0
\$ 0				
(b) Conceptual design costs	480	0	0	0
480				
(c) Decontamination and Decommissioning (D&D)	0	0	0	0
0				
(d) NEPA documentation costs	25	0	0	0
25				
(e) Other project related costs	900	25	25	25
995				20

b/ Applicable escalation rates are taken from the DOE Oak Ridge Field Office escalation multipliers issued October 1993. The escalation rates were based on escalation of 3.3 percent in FY 1995, 3.4 percent in FY 1996, and 3.3 percent in FY 1997, and 3.3 percent in FY 1998.

1. Title and Location of Project:		Sanitary Sewer Upgrade					
2a.	Project No.: 95-D-122						
	Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (Continued)	2b.					
Construction Funded							
<hr/>							
(f)	Total other project costs	\$ 1,405	\$ 25	\$ 25	\$ 25	\$ 20	
\$ 1,500							
(g)	Total project costs (TPC)	\$ 1,910	\$ 4,195	\$ 6,025	\$ 14,025	\$ 7,345	
\$ 33,500							
(h)	LESS: Non-Federal contribution	0	0	0	0	0	
0							
(i)	Net Federal total project cost (TPC)	\$ 1,910	\$ 4,195	\$ 6,025	\$ 14,025	\$ 7,345	\$ 33,500
<hr/>							
b. Related annual costs (estimated life of project -- 30 to 40 years)							
1.	Facility operating costs						\$ 150
2.	Facility maintenance and repair costs						150
3.	Programmatic operating expenses directly related to the facility						0
4.	Capital equipment not related to construction but related to the programmatic effort in the facility						0
5.	GPP or other construction related to programmatic effort in the facility						0
6.	Utility costs						0
7.	Other costs						0
	Total related annual costs						\$

1. Title and Location of Project:		Sanitary Sewer Upgrade
2a.	Project No.: 95-D-122	
	Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (Continued)	2b.
Construction Funded		

12. Narrative Explanation of Total Project Funding and Related Funding Requirements

a.	Total project funding	
1.	Total facility costs	
(a)		Line Item
		--
		Construct
		ion line
		item
		costs for
		the
		engineeri
		ng
		design,
		procureme
		nt,
		demolitio
		n, and
		construct
		ion to
		replace
		the Y-12
		sanitary
		sewer
		system
		are
		estimated
		to be
		\$32,000,0
		00.
(b)		PE&D --
None.		
(c)		Operating
expense funded equipment --	None.	
(d)		
Inventories --	None.	
2.	Other project costs	
(a)		R&D
necessary to complete construction --	None.	
(b)		Conceptua
		l design
		--
		Approxima

1. Title and Location of Project:	Sanitary Sewer Upgrade
2a. Project No.: 95-D-122	
Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (Continued)	2b.
Construction Funded	

tely
\$480,000
were
incurred
to
develop
the scope
of the
project.

(c)

Decontamination and decommissioning (D&D) -- None.

(d) NEPA
documentation -- Approximately \$25,000 were incurred to develop NEPA documentation.

(e) Other
project
related
funding -
-
Engineeri
ng and
operation
al
support
activitie
s for Y-
12 Plant
functions
before
and
during
design
and
construct
ion of
approxima
tely
\$995,000.

b. Related annual costs

1. Facility operating costs -- Approximately \$150,000 for facility operating costs.
2. Facility maintenance and repair costs -- Approximately \$150,000 for maintenance and repair costs.
3. Programmatic operating expenses directly related to the facility -- None.
4. Capital equipment not related to construction but related to the programmatic effort in the facility -- None.

1. Title and Location of Project:	Sanitary Sewer Upgrade
2a. Project No.: 95-D-122	
Oak Ridge Y-12 Plant, Oak Ridge, Tennessee (Continued)	2b.
Construction Funded	

- 5. GPP or other construction related to the programmatic effort in the facility -- None.
- 6. Utility costs -- None.
- 7. Other costs -- None.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project:CMR Upgrades Project	2a.Project No.: 95-D-102
Los Alamos National Laboratory, Los Alamos, New Mexico	2b.Construction Funded

SIGNIFICANT CHANGES

- Total estimated cost for Processed Chilled Water, Main Vault, Acid Vents and Drains, and Exhaust Duct Washdown Recycle System Upgrades have been adjusted to reflect completed CDR estimates.
- FY 1998 obligation was reduced \$4.9 million in order optimally phase CMR upgrades with other LANL restructuring activities.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Stewardship

1. Title and Location of Project:		CMR Upgrades Project
2a.	Project No.: 95-D-102 <u>1</u> / Los Alamos National Laboratory, Los Alamos, New Mexico	2b.
Construction Funded		

3a. Date A-E Work Initiated, (Title I Design Start Scheduled):	1st Qtr. FY 1992	5. Previous Cost Estimate:
		Total Estimated Cost (TEC) --
\$174,100		
3b. A-E Work (Titles I & II) Duration:	84 months	Total Project Cost (TPC) --
\$223,635		

4a. Date physical Construction Starts:	3rd Qtr. FY 1993	6. Current Cost Estimate:
		TEC -- \$174,100 <u>2</u> /
4b. Date Construction Ends:	4th Qtr. FY 2002	TPC -- \$223,635
7. <u>Financial Schedule (Federal Funds):</u>		

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1992	\$ 12,000	\$ 6,250 <u>3</u> /	\$ 18,250	\$ 2,757
1993	10,000	0	10,000	5,061
1994	10,250	0	10,250	10,504
1995	3,300	0	3,300	13,363
1996	9,940	1,000 <u>4</u> /	10,940	14,909
1997	15,000	0	15,000	16,270
1998	106,360	0	15,700	19,080
1999	0	0	27,400	27,400

- 1/ Prior to FY 1995, CMR Upgrades Phase 1 was a subproject within Nuclear Weapons Research Development and Testing Facilities Revitalization, Phase III (90-D-102). In FY 1995, Phase 1 was segregated and the scope of Phases 2 and 3 were added to create this stand alone line item.
- 2/ Phase 3 scope, cost, and schedule are contingent upon future programmatic requirements based upon the results of the Programmatic Environmental Impact Statement (PEIS) and Site Wide Environmental Impact Statement (SWEIS). Therefore, no funds are requested for Phase 3 in FY 1998 and no specific funding has been allocated for the upgrade in the Departments' Five-Year Plan.
- 3/ \$6,250,000 was reprogrammed to CMR, Phase 1 subproject of Nuclear Weapons Research, Development and Testing Facilities Revitalization, Phase III (90-D-102) from Special Nuclear Materials Laboratory Replacement Project (88-D-105). Reprogramming 91-R-14 was executed in FY 1992.
- 4/ \$1,000,000 was reprogrammed by DOE Internal Reprogramming to the CMR Upgrades Project (95-D-102) in the 1st Qtr. FY 1996 from Special Nuclear Materials Laboratory (SNML) replacement project (88-D-105).

1. Title and Location of Project:			CMR Upgrades Project, Los Alamos	
National	2a.		Project No.: 95-D-102	
	Laboratory, Los Alamos, New Mexico (Continued)		2b.	
Construction Funded				
2000	0	0	27,000	27,000
2001	0	0	20,450	20,450
2002	0	0	15,810	17,306

1. Title and Location of Project:		CMR Upgrades Project, Los Alamos
National	2a.	Project No.: 95-D-102
	Laboratory, Los Alamos, New Mexico (Continued)	2b.
Construction Funded		

8. Project Description, Justification and Scope

The Chemistry and Metallurgy Research (CMR) Building is the largest structure at the Los Alamos National Laboratory (550,000 square feet). Construction of the CMR Building was completed in 1952. Most of the major mechanical and electrical equipment has reached the end of its design life.

Since its construction 40 years ago, the CMR Building has been used for research, development, and analytical work with plutonium, uranium and their alloys, and other materials in support of weapons, nuclear materials, and other Laboratory programs. This work continues to be essential to the nation's weapons program, with the principal activities in the building being in support of the plutonium research, development, and demonstration activities conducted at the Laboratory's Plutonium Handling Facility at TA-55. The activities that are critical to these plutonium operations are:

- Essential daily analytical chemistry and metallurgical services on plutonium and other actinides.
 - Analyses of plutonium metal preparations for the Laboratory's Weapons Research, Development, and Test Programs.
 - Analyses required for development and demonstration of new and improved processing methods for scrap recovery.
 - Analyses required for accountability and verification of material received or shipped and for on-site transfers.
- The CMR Building future role is also essential for support of several major Defense Programs areas which include:
 - Enhanced Safety and Reliability of Nuclear Weapons
 - Lead Technical Laboratory for Pu and U Processing
 - Weapons Dismantlement and Component Storage

The primary purpose of this project is to upgrade facility systems and infrastructure that has been in continuous operation for 40 years and are near the end of their useful life. Such upgrading will ensure the continued safety of the public and Laboratory employees and increase the operational safety, reliability and security of essential activities. Increased safety, reliability, and security are critical to the continued operation of the Laboratory's Stockpile Stewardship Programs and other national defense programs.

The Special Nuclear Materials Laboratory (SNML) Project was authorized (88-D-105) to replace the CMR Building at Los Alamos National Laboratory. In FY 1990, the project was put on hold pending a substantive review of the project including other potential options for providing the necessary specialized Laboratory space. As the planned completion date of the SNML continued to be pushed back, it became necessary to provide interim upgrades to CMR to allow its safe and reliable use in the interim period; \$6,250,000 was reprogrammed (91-R-14, executed in FY 1992) from the SNML line item to Project 90-D-102, Nuclear Weapons Research, Development and Testing Facilities Revitalization, Phase III (WRD&T Revit., 3), subproject CMR Upgrades (Phase 1). Later in FY 1991, it was decided not to proceed with the construction of SNML but provide interim upgrades, to CMR (Phase 1) and to identify further upgrades based on safety and risk assessment, for continued long-term operations. The result of these safety and risk assessments is an Interim Safety Analysis Report (ISAR). The findings of the ISAR are the basis for the scope of CMR Upgrades Phases 2 and 3, which were combined with Phase 1 to produce this stand alone line item in FY 1995.

The ISAR includes an analysis of risks associated with natural phenomena design basis accidents, current operations, and comparison to criteria (6430.1A). The ISAR was utilized as the basis to identify and prioritize upgrades that would be

1. Title and Location of Project:	CMR Upgrades Project, Los Alamos
National	Project No.: 95-D-102
2a.	2b.
Laboratory, Los Alamos, New Mexico (Continued)	
Construction Funded	

required to continue operations in a safe, secure, and reliable manner for at least the next 20 years.

1. Title and Location of Project:		CMR Upgrades Project, Los Alamos
National	2a.	Project No.: 95-D-102
	Laboratory, Los Alamos, New Mexico (Continued)	2b.
Construction Funded		

8. Project Description, Justification and Scope (Continued)

a. CMR Phase 1 Upgrade

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>
	<u>Construction Start - Completion Dates</u>					
1998	\$51,600	\$41,800	\$4,800	\$4,400	\$600	\$0 3rd Qtr. FY 1993 - 3rd Qtr. FY

	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	
Obligations 5/	<u>\$41,800</u>	<u>\$4,800</u>	<u>\$4,400</u>		\$600	\$0

Phase 1 was formerly part of WRD&T Revit, 3 with a TEC of \$49,500,000. Based upon the 1995 baseline change proposal and the completion of the CDR, the TEC changed to \$51,600,000 and completion date changed from 3rd Qtr. FY 1996 to 3rd Qtr. FY 1998.

Phase 1 of this project consists of required and urgent capital equipment replacements and upgrades in the CMR Building. Individual tasks were initially identified by a panel commissioned by the Deputy Assistant Secretary for Military Application (DASMA) in July 1990, as the minimum essential effort required to maintain operations in the CMR Building while a Safety Analysis Report (SAR) was prepared.

The FY 1998 funds for Phase 1 will be used to complete Phase 1 construction activities. Most Phase 1 construction activities will be substantially completed 3rd Qtr. FY 1997.

The equipment replacements and upgrades included:

- **Continuous Air Monitor (CAM) Installations**

Install a new CAM system in the Wings 3, 5, 7, and 9 laboratories. Upgrades include installation of CAMs, Fixed head Air Samplers (FAS), and glovebox hand monitors as required by DOE Order 5480.11 and AR 3-7. Remote monitoring capabilities at the Health Physics office and a data logging system are also included. Existing vacuum systems in Wings 3, 5, and 7 will be utilized while the vacuum system in Wing 9 will be expanded. This project is complete.

- **HVAC Blowers and Motors**

Replace existing laboratory exhaust fans in the CMR Building and provide vibration analysis for approximately twenty exhaust fans in the CMR Building. Immediate needs are to replace the 200 HP exhaust fans on the first floor of the

5/ This obligation profile is added as an explanation of the proposed obligations for this subproject, based on the new full funding initiative. Item 7, Financial Schedule, does not show obligations for individual subprojects.

1. Title and Location of Project:		CMR Upgrades Project, Los Alamos
National	2a.	Project No.: 95-D-102
	Laboratory, Los Alamos, New Mexico (Continued)	2b.
Construction Funded		

filter towers in Wings 3, 5, and 7. Other exhaust fans may require replacement contingent on the scope of the Phase 2 Confinement Zone Separation upgrade. This subproject is 97 percent complete.

- **Electrical Upgrades**

The Distribution Analysis and Power Planning Evaluation and Reporting (DAPPER) software will be used for analysis, calculations, and record drawings for all electrical upgrades. Provisions to incorporate a future facility computer monitoring and limited control system will be provided as part of the Electrical Upgrades.

8. Project Description, Justification and Scope (Continued)

Exterior Electrical Upgrades: Replace inadequately sized exterior sectionalizing switches, eliminate existing exterior single point failures, modify exterior underground electrical system to allow switching and maintenance functions, upgrade existing controls and correct deficiencies to the existing administration wing, and Wings 1, 3, 4, and 9 substations. This portion of Electrical Upgrades is scheduled for completion 3rd Qtr. FY 1997.

Substations Upgrade: Replace substations in Wings 2, 5, and 7. This portion of Electrical Upgrades is scheduled for completion 2nd Qtr. FY 1997.

Wing Electrical Upgrades: Upgrade the interior low voltage power distribution system for all wings except 2 and 4 in the CMR Building. This includes the replacement of power and lighting panel boards, laboratory power panel boards, bus ways, motor control centers, replacement of all obsolete branch and feeder wiring systems, rewiring of laboratories, and upgrading the emergency and exit lighting systems. This portion of Electrical Upgrades is scheduled for completion 2nd Qtr. FY 1997.

Electrical Upgrades to Support Safe Standby, Wings 2 and 4: Upgrade the interior low voltage power distribution system in Wings 2 and 4, which is necessary for safety systems. This portion of Electrical Upgrades is scheduled for completion 4th Qtr. FY 1998.

Spinal Corridor Cable Tray: Provide a cable tray system in the attic spinal corridor. This portion of Electrical Upgrades was completed 1st Qtr. FY 1996.

Grounding and Lightning Protection: Upgrade the CMR Building grounding and lightning protection systems. This portion of Electrical Upgrades is scheduled for completion 1st Qtr. FY 1997.

- **Stack Monitors Upgrade**

Provide a stack effluent monitoring system for the CMR Building that is in compliance with DOE and EPA requirements. Each stack will be evaluated to determine the type of monitoring required. Each stack system will be stand alone, consisting of in-line samplers, CAMS, vacuum pumps, and associated tubing, wiring, and signal processing equipment. This upgrade also includes a data collection system from all of the stack CAM's to the CMR operations room and the ES&H operations room. The stack effluent monitoring will be in compliance with 40 CFR 61 and DOE Order 6430.1A. This subproject is currently estimated to be 97 percent complete.

1. Title and Location of Project:		CMR Upgrades Project, Los Alamos
National	2a.	Project No.: 95-D-102
	Laboratory, Los Alamos, New Mexico (Continued)	2b.
Construction Funded		

- **Uninterruptable Power Supply (UPS) Installation**

This Upgrade is in support of the Stack Monitors Upgrade. There will be one UPS supporting the stack monitoring data collection computer systems. The UPS will be capable of providing backup power to the stack effluent monitoring systems for a 4 hour period. This subproject is 99 percent complete.

- **Duct Modification**

Backdraft Dampers: Provide positive shutoff intake backdraft dampers in the supply air ductwork in Wings 2, 3, 4, 5, 7, and 9. This subproject is 92 percent complete.

Duct Washdown Upgrade: Upgrade the existing exhaust duct washdown system in Wings 3, 5, and 7. This includes replacement of piping, valves, and spray heads and installation of new flow measurement devices. This portion of the Duct Modifications is scheduled for completion 4th Qtr. FY 1996.

1. Title and Location of Project:		CMR Upgrades Project, Los Alamos
National	2a.	Project No.: 95-D-102
	Laboratory, Los Alamos, New Mexico (Continued)	2b.
Construction Funded		

8. Project Description, Justification and Scope (Continued)

- **Sanitary Sewer Upgrades**

This subproject was completed 3rd Quarter of FY 1994.

- **Acid Vents and Drains Upgrades**

Aging piping and a lack of gradient in the acid drain system in the basement of the CMR Building has led to corrosion and clogging of the system. This upgrade includes evaluation and documentation of the existing system, prioritization of the system deficiencies, and cost estimates to correct each deficiency for Wings 3, 5, and 7. Construction will include replacement of piping and components including threaded nipples, fittings, valves, flanged fittings, and gaskets with compatible new components. Remaining system replacement will be incorporated in Phase 2. This subproject is scheduled for completion 4th Qtr. FY 1998.

- **Fire Hazard Analysis (Formerly Fire Protection Upgrades)**

A Fire Hazard Analysis (FHA) on the CMR Building will be completed in accordance with DOE Order 5480.7A. A cost benefit analysis will be performed on the results of the FHA and the existing National Fire Protection Act (NFPA) 101 analysis to prioritize deficiencies. Identified required upgrades will be done as part of Phase 2. This subproject was completed during the 2nd Qtr. FY 1996.

- **Safety Analysis Report**

Perform a complete safety analysis for the CMR Building operations. Activities include analysis, documentation, and review. Complete an Interim Safety Analysis Report (ISAR) to aid in determining the basis for long term upgrades for the CMR Building. Produce a Final Safety Analysis Report (FSAR) to define the safety envelope and the authorization basis for the operation of the CMR Building. The FSAR is to be produced in accordance with DOE Order 5480.23, and related standards for Nuclear Facility Safety Analysis Reports. This was completed 4th Qtr. FY 1995.

- **Engineering Assessments/CDR/EA**

Engineering Assessment--This project was completed 2nd Qtr. FY 1996.

Phase 1 funding includes the development of the CDR for those items that have been identified and prioritized as a result of the Interim Safety Analysis Report (ISAR). They are comprised of those upgrade items that are required to extend the operational life of the facility for at least another 20 years based upon safety and compliance for present and future operations. The original CDR was completed during the 3rd Qtr. FY 1995; the Supplemental CDR effort is scheduled for completion 1st Qtr. FY 1997.

An environmental assessment, including all aspects of Phase 2, has been prepared based upon the conceptual design report. This EA assessed the environmental impact of construction as represented by the Phase 2 scope of work. Approval is scheduled for 2nd Qtr. FY 1997.

1. Title and Location of Project:		CMR Upgrades Project, Los Alamos
National	2a.	Project No.: 95-D-102
	Laboratory, Los Alamos, New Mexico (Continued)	2b.
Construction Funded		

8. Project Description, Justification and Scope (Continued)

b. CMR Phase 2 Upgrade

The Phase 2 components are needed to maintain infrastructure, improve safety for public and workers, and enhance environmental management.

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>
	<u>Construction Start - Completion Dates</u>					
2002	\$122,500	\$0	\$6,140	\$10,600	<u>\$105,760</u>	<u>\$0</u> <u>2nd Qtr. FY 1997</u> - 4th Qtr. FY

	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
Obligations 5/	<u>\$0</u>	<u>\$6,140</u>	<u>\$10,600</u>	<u>\$15,100</u>	<u>\$90,660</u>

Based upon completion of the CDR for the Phase 2 and 3 scope, the TEC for this phase is increased from \$85,000,000 to \$122,500,000. The construction start date changed from 2nd Qtr. FY 1996 to 2nd Qtr. FY 1997 and the end date changed from 4th Qtr. FY 2003 to 4th Qtr. FY 2002. (Phase 3 scope, cost, and schedule are contingent upon future programmatic requirements based upon the results of the Programmatic Environmental Impact Statement (PEIS) and Site Wide Environmental Impact Statement (SWEIS). Therefore, no funds are requested for Phase 3.

The FY 1998 funds will be used to complete Phase 2 activities.

The additional long term upgrades developed by the Phase 2 CDR process are:

- **Seismic and Tertiary Confinement (Wings 3, 5, 7, and 9)**

Structural strengthening to meet the seismic criteria for hazard Category 2 operations. Modification of the existing exterior structural openings in these wings to create a tertiary confinement barrier. Structural strengthening of the Administration Wing (which houses the Operations Center) to meet the seismic criteria for worker safety. Hardening of building openings to security requirements which are also being modified for tertiary confinements. These openings include doors, windows, louvers, etc.

- **Ventilation and Confinement Zone Separation (Wings 3, 5, 7, and 9)**

Renovate the mechanical systems and the related control systems to replace components that are near the end of their useful lives and to improve confinement zone separation throughout each Wing. Architecturally modifying Wings 3, 5,

5/ This obligation profile is added as an explanation of the proposed obligations for this subproject, based on the new full funding initiative. Item 7, Financial Schedule, does not show obligations for individual subprojects.

1. Title and Location of Project:		CMR Upgrades Project, Los Alamos
National	2a.	Project No.: 95-D-102
	Laboratory, Los Alamos, New Mexico (Continued)	2b.
Construction Funded		

and 7 to create a secondary confinement barrier. Providing an alarm for each enclosure to alert workers when the mechanical systems are not operating according to safety standards for the facility. Providing a central, chilled water plant to support the mechanical systems' renovations to the building.

1. Title and Location of Project:		CMR Upgrades Project, Los Alamos
National	2a.	Project No.: 95-D-102
	Laboratory, Los Alamos, New Mexico (Continued)	2b.
Construction Funded		

8. Project Description, Justification and Scope (Continued)

- **Standby Power** (Wings 3, 5, 7, and 9)

Provide standby electrical power to operate the most important mechanical systems at a reduced level sufficient to maintain negative pressure in the laboratory enclosures. This will reduce possibility of spread of contamination due to the loss of offsite power to the ventilation system.

- **Communications** (Wings 3, 5, 7, and 9)

Improve emergency communications systems thereby improving worker safety.

- **Wing 1 (HVAC) Upgrades/Wing 1 Interim Decontamination**

Decontaminate the unoccupied, contaminated laboratories in Wing 1, modifying the HVAC exterior intake and exhaust locations for Wing 1 to improve worker health and safety.

- **Operations Center** (Administration Wing)

Improve the ergonomics and reliability of the building's central monitoring and control capabilities. Install transfer capability and wiring from the standby power generator to the CMR Operation Center to support all functions or systems required to recover the facility after significant accidents.

- **Process Chilled Water** (Wings 3, 5, and 7)

Replace the 2 existing 40 year old evaporative coolers in each Wing with a single refrigeration unit to provide chilled water for process equipment. Also, replace the existing 40 year old process chilled water piping system with a new piping system.

- **Main Vault**

CAMs - Install new Canberra CAMs in the vault, ASM 2000 controllers in the anteroom, and incorporate remote monitoring (similar to Wing CAM systems) to the ES&H office. This upgrade would utilize the generic design established for the Wing CAMs.

- **Acid Vents and Drains** (Wings 3, 5, and 7)

Correct deficiencies not covered in Phase 1 upgrades (Phase 1 addresses major leaks and flanges). Correct area with inadequate slope, replace branches and risers to laboratories as required, and upgrade the ventilation of the system.

- **Fire Protection Upgrades** (Entire Facility)

Correct fire protection system deficiencies as identified in the 1992 NFPA 101 analysis, and the Fire Hazard Analysis (to be completed in Phase 1). Deficiencies will be prioritized in a cost benefit analysis which will be completed in

1. Title and Location of Project:		CMR Upgrades Project, Los Alamos
National	2a.	Project No.: 95-D-102
	Laboratory, Los Alamos, New Mexico (Continued)	2b.
Construction Funded		

Phase 1. Examples of current identified deficiencies are: Add check valves in fire protection risers, add backflow preventors in the sprinkler system, provide fire dampers in duct penetrations, replace fire alarm panels.

1. Title and Location of Project:	CMR Upgrades Project, Los Alamos
National	2a. Project No.: 95-D-102
	2b. Laboratory, Los Alamos, New Mexico (Continued)
Construction Funded	

8. Project Description, Justification and Scope (Continued)

- **Exhaust Duct Washdown Recycling System (Wings 3, 5, and 7)**

This recycling system will significantly reduce the waste stream from the facility. The reduction in the waste stream will reduce the demands on the current waste treatment plant.

- **Wings 2 and 4 Safe Standby**

This upgrade includes the costs necessary to establish a safe standby condition for Wings 2 and 4 pending future programmatic use. Included are identification of safety systems required for safe standby deactivation/decontamination of abandoned systems and gloveboxes, removal of all radioactive materials and chemicals, and removal or stabilization of all loose contamination.

- **ES&H Support Activities**

Additional enhanced ES&H support activities based on the lessons learned from Phase 1 are being incorporated. These efforts include waste management, waste minimization, ES&H support, risk analysis, and ES&H equipment including personnel protective equipment.

c. CMR Phase 3 Upgrades

Phase 3 scope, cost, and schedule are contingent upon future programmatic requirements based upon the results of the Programmatic Environmental Impact Statement (PEIS) and Site Wide Environmental Impact Statement (SWEIS). Therefore, no funds are requested for Phase 3 in FY 1998 and no specific funding has been allocated for the upgrade in the Departments' Five-Year Plan.

1. Title and Location of Project:	CMR Upgrades Project, Los Alamos
National	Project No.: 95-D-102
2a.	2b.
Laboratory, Los Alamos, New Mexico (Continued)	
Construction Funded	

9. Detail of Cost Estimate 2/ 6/

<u>EQUIP</u>	<u>SUBPROJECTS</u>	<u>PM & S</u>		<u>ED&I</u>		<u>CONST</u>	<u>STD</u>
		<u>CONTINGENCY</u>		<u>TEC</u>			
a. <u>Phase 1</u>							
	Sanitary Sewer Modifications	\$ 21	\$ 71	\$ 68	\$ 0	\$ 0	\$ 160 <u>7/</u>
	Acid Vents and Drain Modifications	193	577	651	0	86	1,507
	Stack Monitors Upgrades	430	1,467	704	643	112	3,356
	CAM Installation	536	718	1,447	1,274	204	4,179 <u>q/</u>
	Electrical Upgrades	3,443	4,815	14,832	1,831	1,913	26,834
	Ductwork Modifications	242	271	1,218	0	153	1,884
	HVAC Blowers and Motors	116	129	426	176	56	903
	UPS Installation	77	177	304	0	39	597
	Fire Hazard Analysis (formerly Fire Protection Upgrades)		299	0	0	0	15
314							
	Engineering Assessment/Phase 2 Planning	1,284	1,669	0	0	0	2,953 <u>q/</u>
	CDR	678	4,111	0	0	257	5,046 <u>h/</u>
	Environmental Assessment	1,273	0	0	0	69	1,342 <u>g/</u>
	Safety Analysis Report	<u>2,525</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>2,525</u> <u>q/</u>
	Phase 1 Subtotal	<u>\$ 11,117</u>	<u>\$ 14,005</u>	<u>\$ 19,650</u>	<u>\$ 3,924</u>	<u>\$ 2,904</u>	<u>\$ 51,600</u>

2/ Phase 3 scope, cost, and schedule are contingent upon future programmatic requirements based upon the results of the Programmatic Environmental Impact Statement (PEIS) and Site Wide Environmental Impact Statement (SWEIS). Therefore, no funds are requested for Phase 3 in FY 1998 and no specific funding has been allocated for the upgrade in the Departments' Five-Year Plan.

6/ The estimates do not include site overhead/landlord costs since FY 1992 was the first year of project funding.

7/ Completed.

8/ CDR and Environmental Assessment costs are carried as part of the Phase 1 Engineering Assessment/Phase 2 Planning Activities and are broken out for clarity.

1. Title and Location of Project:	CMR Upgrades Project, Los Alamos
National	Project No.: 95-D-102
2a.	2b.
Laboratory, Los Alamos, New Mexico (Continued)	
Construction Funded	

9. Detail of Cost Estimate 2/ 6/ (Continued)

<u>EQUIP</u>	<u>SUBPROJECTS</u>	<u>PM & S 9/</u> <u>CONTINGENCY</u>	<u>ED&I</u>	<u>TEC</u>	<u>CONST</u>	<u>STD</u>
b. <u>Phase 2</u>						
	Seismic and Tertiary Confinement	\$ 4,028	\$ 2,855	\$ 6,715	\$ 0	\$ 15,545
	Ventilation & Confinement Zone Separation	17,791	8,358	34,176	0	68,651
	Communications	1,076	926	1,243	250	4,152
	Wing 1 HVAC Upgrades & Decontamination	167	73	326	0	644
	Operations Center	425	391	625	0	1,640
	Standby Power	1,534	1,070	2,596	0	5,917
	Wings 2 and 4 Safe Standby	1,937	784	3,845	0	7,472
	Process Chilled Water	1,119	746	1,734	0	4,319
	Main Vault	187	268	180	0	723
	Acid Vents and Drains	2,066	709	3,782	0	7,971
	Fire Protection	1,114	363	2,300	0	4,298
	Exhaust Duct Washdown Recycle	303	255	468	0	1,168
	Phase 2 Subtotal	<u>\$ 31,747</u>	<u>\$ 16,798</u>	<u>\$ 57,990</u>	<u>\$ 250</u>	<u>\$ 122,500</u>
	Total Estimated Cost	<u>\$ 42,864</u>	<u>\$ 30,803</u>	<u>\$ 77,640</u>	<u>\$ 4,174</u>	<u>\$ 174,100</u>

Engineering, design, and inspection cost-of-services were estimated from historical records and experience with drawing and man hour requirements established for each discipline, ED&I represent approximately 43 percent of construction costs. ED&I costs captured in Phase 1 included Phase 2 planning and CDR development for Phases 1, 2, and 3. Phase 2 ED&I represent approximately 29 percent of Phase 2 construction.

2/ Phase 3 scope, cost, and schedule are contingent upon future programmatic requirements based upon the results of the Programmatic Environmental Impact Statement (PEIS) and Site Wide Environmental Impact Statement (SWEIS). Therefore, no funds are requested for Phase 3 in FY 1998 and no specific funding has been allocated for the upgrade in the Departments' Five-Year Plan.

6/ The estimates do not include site overhead/landlord costs since FY 1992 was the first year of project funding.

9/ Included are project management, project controls, administration, construction management, acquisition, design management, quality assurance, and ES&H support.

1. Title and Location of Project:		CMR Upgrades Project, Los Alamos
National	2a.	Project No.: 95-D-102
	Laboratory, Los Alamos, New Mexico (Continued)	2b.
Construction Funded		

9. Detail of Cost Estimate 2/ 6/ (Continued)

Contingencies represent approximately 11 percent of costs. The contingency rate is the result of a contingency analysis of various items based on relative risk ratings compared to ratings of relative importance of a particular item to the project. The analysis of various items results in different contingency rates depending on the item. The contingency rate shown here is an average rate resulting from the contingency analysis and weighing according to the item's relative cost.

10. Method of Performance

Procurement will be accomplished under fixed-price subcontracts awarded on the basis of competitive bidding. Consideration will be given to cost-plus-fixed fee on decontamination and refurbishment work on the CMR. Upgrades construction will be done by fixed price contractors and the Laboratory's support services subcontractor. The operating contractor and contracted Architect-Engineers will perform construction inspection.

2/ Phase 3 scope, cost, and schedule are contingent upon future programmatic requirements based upon the results of the Programmatic Environmental Impact Statement (PEIS) and Site Wide Environmental Impact Statement (SWEIS). Therefore, no funds are requested for Phase 3 in FY 1998 and no specific funding has been allocated for the upgrade in the Departments' Five-Year Plan.

6/ The estimates do not include site overhead/landlord costs since FY 1992 was the first year of project funding.

1. Title and Location of Project:	CMR Upgrades Project, Los Alamos
National	Project No.: 95-D-102
2a. Laboratory, Los Alamos, New Mexico (Continued)	2b.
Construction Funded	

11. Schedule of Project Funding and Other Related Funding Requirements

	<u>Prior Years FY 1999</u>	<u>FY 1997 Outyear</u>	<u>FY 1998 Total</u>	
a. Total project costs <u>2/</u>				
1. Total facility costs				
(a) Line item (Section 9)	\$ 46,590	\$ 16,270	\$ 19,080	\$ 27,400 \$ 64,760
\$174,100				
(b) Plant, Engineering and Design (PE&D)	0	0	0	0
(c) Operating expense funded equipment.		0	0	0
0				
(d) Inventories	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total facility costs (Federal and Non-Federal) . . .	\$ 46,590	\$ 16,270	\$ 19,080	\$ 27,400 \$ 64,760 \$174,100
2. Other project costs				
(a) R&D necessary to complete project	\$ 0	\$ 0	\$ 0	\$ 0
\$ 0				
(b) Conceptual design costs		0	0	0
0 <u>8/</u>				
(c) Decontamination & Decommissioning (D&D)		0	0	0
0				
(d) NEPA documentation costs	0	0	0	0
(e) Other project related costs	<u>8,545</u>	<u>2,423</u>	<u>3,500</u>	<u>5,000</u> <u>30,067</u>
<u>49,535</u>				
(f) Total other project costs	\$ <u>8,545</u>	\$ <u>2,423</u>	\$ <u>3,500</u>	\$ <u>5,000</u> \$ <u>30,067</u>
\$ <u>49,535</u>				
(g) Total project costs	\$ <u>55,135</u>	\$ <u>18,693</u>	\$ <u>22,580</u>	\$ <u>32,400</u> \$ <u>94,827</u>
\$ <u>223,635</u>				
(h) LESS: Non-Federal contribution	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
<u>0</u>				
(i) Net Federal total project costs (TPC)	\$ <u>55,135</u>	\$ <u>18,693</u>	\$ <u>22,580</u>	\$ <u>32,400</u> \$ <u>94,827</u>
\$ <u>223,635</u>				
b. Related annual costs (estimated life of project--20 to 40 years)				

2/ Phase 3 scope, cost, and schedule are contingent upon future programmatic requirements based upon the results of the Programmatic Environmental Impact Statement (PEIS) and Site Wide Environmental Impact Statement (SWEIS). Therefore, no funds are requested for Phase 3 in FY 1998 or in the Departments' Five-Year Plan.

8/ CDR and Environmental Assessment costs are carried as part of the Phase 1 Engineering Activities/Phase 2 Planning Activities and are broken out for clarity.

1. Title and Location of Project:		CMR Upgrades Project, Los Alamos
National	2a.	Project No.: 95-D-102
	Laboratory, Los Alamos, New Mexico (Continued)	2b.
Construction Funded		

1.	Facility operating costs	\$ 10,000
2.	Facility maintenance and repair costs	2,500
3.	Programmatic operating expenses directly related to the facility	30,000
4.	Capital equipment not related to construction but related to the programmatic effort in the facility	1,000
5.	GPP or other construction related to programmatic effort in the facility	1,000
6.	Utility costs	2,450
7.	Other costs	0
	Total related annual costs	<u>\$ 46,950</u>

1. Title and Location of Project:	CMR Upgrades Project, Los Alamos
National	Project No.: 95-D-102
2a.	2b.
Laboratory, Los Alamos, New Mexico (Continued)	
Construction Funded	

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

- a. Total project funding
 - 1. Total facility costs
 - (a) Line item -- Narrative not required.
 - (b) PE&D -- None.
 - (c) Operating expense funded equipment -- Narrative not required.
 - (d) Inventories -- None.
 - 2. Other project costs
 - (a) R&D necessary to complete construction -- No research and development is necessary to establish the specific design and construction features.
 - (b) Conceptual design -- None. Phase 1 line item. g/
 - (c) Decontamination and Decommissioning (D&D) -- None.
 - (d) NEPA documentation -- None. Phase 1 line item costs include NEPA documentation costs. h/
 - (e) Other project related costs -- Operational testing and acceptance, including the Operational Readiness Review has been allowed on selected major system upgrades. Training materials, programs, and test/certification will be updated to reflect the change in site operations resulting from selected systems upgrades becoming operational. See also paragraph 17, Environmental Impacts, below.
- b. Related annual costs
 - 1. Facility operating costs -- The CMR facility were estimated from the FY 1995 budget requirements for CMR operations.
 - 2. Facility maintenance and repair costs -- These are based upon current budget requirements for CMR maintenance.
 - 3. Programmatic operating expenses directly related to the facility -- The programmatic effort which relies upon the direct and primary use of the CMR facilities was established at the FY 1992 level-of-effort based on the unique capabilities of handling radioactive materials. This assumes a constant level-of-effort in these programs.
 - 4. Capital equipment requirements for programmatic support were estimated at \$1,000,000/year based upon recent trends in CMR programmatic needs.
 - 5. GPP or other construction related to programmatic effort -- These are anticipated to be approximately \$1,000,000/year based upon current CMR programmatic needs.
 - 6. Utility costs -- These are estimated at \$2,450,000/year based upon current trends in CMR operations.
 - 7. Other costs -- None anticipated.

g/ CDR and Environmental Assessment costs are carried as part of the Phase 1 Engineering Assessment/Phase 2 Planning Activities and are broken out for clarify.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project:Environmental Safety and Health Analytical Laboratory	2a Project No. 94-D-128
Pantex Plant, Amarillo, Texas	2b.Construction Funded

SIGNIFICANT CHANGES

- No funding will be obligated in FY 1998 because the project is on hold pending the results of an ongoing assessment of the need for this project.

DEPARTMENT OF ENERGY
 FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
 (Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
 (Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project: Environmental Safety and Health Analytical Laboratory Pantex Plant, Amarillo, Texas	2a Project No.: 94-D-128 2b Construction Funded
3a. Date A-E Work Initiated (Title I Design Start Scheduled): 2nd Qtr. FY 1994 3b. A-E Work (Titles I and II) Duration: 19 months	5. Previous Cost Estimate: Total Estimated Cost (TEC) -- \$8,800 Total Project Cost (TPC) -- \$9,250
4a. Date Physical Construction Starts: TBD Date Construction Ends: TBD	6. Current Cost Estimate: TEC -- \$8,800 4b. TPC -- \$9,250

7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1994	\$ 800	\$ 0	\$ 800	\$ 4
1995	1,000	0	1,000	548
1996	4,000	0	0	115
1997	0	0	4,000	0
1998	3,000	0	0	3,633
1999	0	0	3,000	4,500

8. Project Description, Justification and Scope

This project provides for the design and construction of a new Environmental Safety and Health Analytical Laboratory (ESHAL). The proposed facility will replace and upgrade the capabilities of the existing chemistry laboratory which is outdated and ill-equipped to serve the needs and responsibilities of chemical analysis for plant materials. The facility will: (a) provide chemical analysis of plant materials and conduct surveillance evaluations on commercially procured weapons materials; and (b) provide environmental testing laboratories which will allow for the onsite testing of environmental samples applicable to the Resource Conservation and Recovery Act (RCRA) and the Environmental Protection Agency (EPA). Instrumentation and equipment will be provided to maintain and extend plant capabilities with respect to expected future accuracies and precision.

* FY 1998 funding will not be obligated because the project is on hold pending the results of an ongoing assessment of the need for this project. If the project is cancelled as a result of the IG audit, the project will be closed out and all remaining funds returned. If the project is approved for continuation, funding will be obligated in FY 1998. In either case, a Baseline Change Proposal (BCP) will be prepared to document the changes.

1. Title and Location of Project:	Environmental Safety and Health Analytical
Laboratory	Project No.: 94-D-128
2a.	2 b .
Pantex Plant, Amarillo, Texas (Continued)	
Construction Funded	

8. Project Description, Justification and Scope (Continued)

The site for the new facility is in the explosive development Zone 11 of the Pantex Plant and has been coordinated with the Pantex Site Development Plan. The building will be located northeast of and adjacent to the existing Weapons Material Development Analytical Laboratory in an effort to consolidate laboratory functions at Pantex Plant. An enclosed connecting ramp will tie this new facility to the existing laboratory. This will allow for shared access, including access to new analytical equipment and utilization of common areas such as the shower/change rooms.

The ESHAL will be a single story structure with approximately 16,400 gross square feet (13,000 net square feet). The facility will be configured into operational areas and support areas based on function and relationship of activities. Separate interior rooms will be provided for mechanical equipment and electrical equipment. All operational areas of the laboratory will have an overall positive pressure provided by the mechanical systems.

The design of this facility will be in accordance with the DOE Explosives Safety Manual (DOE/EV/06194-4) and DOE Order 6430.1A for Class II operations and laboratory scale explosive operations (less than 500 grams). High explosives design load limits will be 25 pounds hardened area, but handling of individual containers will be limited to less than 500 grams.

The ESHAL is projected to have a full-time staff of 20, working a straight daytime shift, Monday through Friday.

A major portion of the site work will consist of grading, paving (roads and parking), utility and storm drainage work. Utilities to be connected to this facility include water (fire and domestic), steam, sewer and electricity. Fire alarm, communication, mechanical and electrical systems will also be provided for building operations. Conditioned electrical power will be supplied for designated analytical equipment. Special ventilation will be provided for the chemical staging area and dust collectors will be supplied for the ventilation system in the explosives area. Each laboratory will have individual temperature control.

An area is provided in the facility for the staging of chemicals to be used throughout the facility. This area will contain ventilation systems, fire protection systems, secondary containment systems and emergency shower and eyewash in accordance with applicable provisions of DOE Order 6430.1A, National Fire Protection Act 30 (NFPA), and the Occupational Safety and Health Act (OSHA)/Texas Administrative code.

Environmental Considerations: All emissions from this facility will meet the requirements of the State of Texas, the Clean Air Act, Clean Water Act and the RCRA. The project will be managed to ensure continued compliance with the provisions and requirements of the Texas Air Control Board and the Texas Water Commission (TWC). Accommodation sites for laboratory generated contaminated waste will be designed in accordance with TWC and EPA requirements. Equipment installation will comply with all required operational safety requirements.

Safety Considerations: The building will be sited a distance greater than or equal to a minimum inhabited building distance from other explosive buildings in accordance with DOE Explosive Safety Manual DOE/EV/06194-4. Fire protection will be provided by a wet-pipe automatic sprinkler system throughout the building. Automatic and manual fire alarms will transmit digital electronic coded signals to the fire station via the Plant Fire Alarm System.

1. Title and Location of Project:	Environmental Safety and Health Analytical
Laboratory	Project No.: 94-D-128
2a.	2 b .
Pantex Plant, Amarillo, Texas (Continued)	
Construction Funded	

Security Considerations: Protection of classified matter in the facility will comply with DOE Order 5632.5. Unclassified computer systems will comply with DOE Order 1360.2B and classified computer systems will comply with DOE Order 5639.6.

Demolition of the existing laboratory facility, three support facilities and two connecting ramps are included in this project. (Buildings 12-8, 12-38, 12-59, 12-59E, 12-R-8, and 12-R-59). A Solid Waste Management Unit (SWMU) has been identified next to the existing laboratory, but does not impact construction of the ESHAL. An identified SWMU in the vicinity of the proposed site for the new laboratory should be a sufficient distance from the site so as not to impact construction of the ESHAL. However, the Corps of Engineers will continue an assessment of the area and any environmental issues which may evolve will be addressed.

8. Project Description, Justification and Scope (Continued)

Between April 1988 and October 1989, four audits were performed on the existing laboratory facility. These audits consisted of a Pantex Industrial Safety Department audit, a Pantex Fire Department audit, Pantex's Environmental Safety and Health Staff audit, and the DOE/HQ Tiger Team Environmental Safety and Health Assessment. The major finding was several instances of incompatible chemical staging. Presently, crowding in the chemical staging area of the current laboratory precludes adequate segregation recommended for laboratories and is not in conformance with 40 CFR 264.175.

Additional liquid-effluent sampling was initiated as a result of draft Section 3008(h) of the Administrative Order of Consent to Pantex Plant, issued by EPA Region 6 on September 7, 1989. One of the interim measures contained within the final terms of the Order drives the sampling of discharges from three operating buildings. The effluent sampling program has been expanded beyond the regulatory requirements under DOE Order 5400.1 which requires the following:

- verification of compliance with Federal, State and local effluent regulations and DOE Orders
- determination of compliance with commitments
- evaluation of the effectiveness of effluent treatment and control
- identification of potential environmental problems
- support of permit revision and/or reissuance
- detection, characterization, and reporting unplanned releases

The DOE Amarillo Area Office Notice AAO-93-1 (dated 10-14-92) re: "Protection of Plant Employees, the Public, and Environment" defines the policies and expectations for Environmental Protection where the operating contractor is expected to conduct a comprehensive environmental monitoring program that will provide early warning of any environmental upset condition. This program must also provide high quality, validated environmental data to meet reporting and assessment needs of the DOE, the Environmental Protection Agency (EPA), State regulatory agencies, and the public.

The present chemical laboratory performs some analyses for the current environmental monitoring plan, but does not have enough work space or sufficient sample staging areas to serve the needs for today or the increasing needs of the future. In recent years, a combination of new instrumentation and increased workload has had several impacts on the effectiveness of the current laboratory. First, the increased equipment has reduced the bench space by over 70 percent from 1400 square feet to 400 square feet. This reduction has forced crowding on the remaining bench space. In addition, the increased equipment has created problems with temperature and environmental controls in the laboratories which make it impossible in some cases to meet the rigid specifications called out by the design laboratories.

1. Title and Location of Project:	Environmental Safety and Health Analytical
Laboratory	Project No.: 94-D-128
2a. Pantex Plant, Amarillo, Texas (Continued)	2 b .
Construction Funded	

In addition to environmental monitoring, containerized hazardous waste must be analyzed for "knowledge of its contents" and for documentation on the transportation manifest in accordance with 40 CFR 262. Offsite laboratories are presently used to analyze most environmental and waste samples. However, these laboratories cannot respond quickly to our needs since up to thirty days are normally required for analytical results.

Onsite analytical capability will allow a rapid turn-around time for waste, soil, and water samples. Also, Pantex procedural and quality assurance recommendations have been made and accepted by the Texas Air Control Board. Additionally, an offsite laboratory which can analyze water or soil for the most common explosive used at the plant does not exist. The Pantex Plant has eighty waste streams which are characterized completely once a year in an effort to reclassify streams which may have a reduced number of cumulative wastes. This waste management activity is in addition to the analyses required for each containerized waste shipment that is tested for the specific hazard(s) at hand. Finally, stringent DOE auditing criteria are in place on site but limited at offsite laboratories.

The scope of the project includes the current analytical chemistry support for weapons and plant activities and the testing of facility discharges, playas, ground water, and ditches. The scope also includes analytical chemistry support for containerized waste and annual characterization of

8. Project Description, Justification and Scope (Continued)

waste streams. Analyses in support of environmental monitoring and waste management will be conducted in the ESHAL in addition to analytical work currently performed in the chemical laboratory.

As a consequence of the proposed laboratory, all chemical functions (including quality control, compatibility, and process labs) will be consolidated to one location at the plant site.

9. Detail of Cost Estimate

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 1,855
1. Engineering design and inspection at approximately 24.0 percent of construction (Item c)	\$ 959	
2. Construction management	391	
3. Project management	505	
b. Land and land rights		0
c. Construction costs		3,930
1. Improvements to land	135	
2. Buildings (\$212/square foot)	3,490	
3. Special equipment	0	
4. Utilities	305	
5. Demolition	0	
d. Standard Equipment		1,480
e. Major computer items		0
f. Removal cost less salvage		355
g. Design and project liaison, testing, checkout, and acceptance		0
h. Subtotal (a through g)		\$ 7,620

1. Title and Location of Project:	Environmental Safety and Health Analytical
Laboratory	Project No.: 94-D-128
2a. Pantex Plant, Amarillo, Texas (Continued)	2 b .
Construction Funded	

i. Contingency at approximately 15.5 percent of above costs.	<u>1,180</u>
j. Total line item cost (Section 11.a.1.(a))	\$ 8,800
k. LESS: Non-Federal contribution	<u>0</u>
l. Net Federal total estimated cost (TEC)	<u>\$ 8,800</u>

10. Method of Performance

The design services (Titles I, II, and partial Title III) will be accomplished by an outside A-E firm and will be administered by DOE or the Operating Contractor (Mason & Hanger-Silas Co., Inc.).

The construction services of this project will be performed by an outside construction contractor operating under a fixed-price, lump-sum contract to be awarded on the basis of competitive bids. This contract will be administered by DOE, Corps of Engineers (COE) or the Operating Contractor.

Construction Management Services will be performed by the COE, DOE, Operating Contractor or by a construction management firm under contract to DOE or the Operating Contractor.

Final connections for new fire alarms and specific communication equipment will be accomplished by the Operating Contractor.

Furniture and non-engineered equipment will be procured separate from the building construction activities.

1. Title and Location of Project:	Environmental Safety and Health Analytical
Laboratory	Project No.: 94-D-128
2a. Pantex Plant, Amarillo, Texas (Continued)	2 b .
Construction Funded	

11. Schedule of Project Funding and Other Related Funding Requirements

	Prior Years FY 1998	FY 1996 FY 1999	FY 1997 Total
a. Total project costs			
1. Total facility costs			
(a) Line item (Section 9.j.)	\$ 552	\$ 115	\$ 0
(b)			\$ 3,633
0 0 0			\$ 4,500
(c)			\$ 8,800
0 0 0 0			0
(d)			0
0			0
Total facility cost	\$ 552	\$ 115	\$ 0
2. Other project costs			
(a)			0
0 0 0 0			0
(b) Conceptual design costs	120	0	0
(c)			0
0 0 0 0			0
(d) NEPA documentation costs	150	0	0
(e) Design criteria costs	50	0	0
(f) Start-up costs	0	0	0
(g) Total other project costs	\$ 320	\$ 0	\$ 0
(h)			\$ 130
\$ 3,633			\$ 450
(i)			Total project costs .
0			\$ 872
(j)			\$ 115
\$ 115			\$ 0
			\$ 4,630
			\$ 9,250
			\$ 872
			\$ 200
b. Related annual costs (estimated life of project--25 years)			
1. Facility operating costs			\$ 100
2. Facility maintenance and repair costs			0
3. Programmatic operating expenses directly related to the facility			100
4. Capital equipment not related to construction but related to the programmatic effort in the facility			0
5. GPP or other construction related to the programmatic effort in the facility			0
6. Utility costs			0
7. Other costs			0
Total related annual costs			\$ 200

1. Title and Location of Project:		Environmental Safety and Health Analytical
Laboratory	2a.	Project No.: 94-D-128
	Pantex Plant, Amarillo, Texas (Continued)	2 b .
Construction Funded		

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a. Total project funding	
1. Total facility costs	
(a)	Line Item --
8,800,000.	
(b)	PE&D -- None.
(c)	Operating
expense funded equipment -- None.	
(d)	Inventories--
None.	
2. Other project costs	
(a)	R&D necessary
to complete project -- None.	
(b)	Conceptual
design -- Estimated to cost \$120,000.	
(c)	
Decontamination & Decommissioning (D&D) -- None.	
(d)	N E P A
	documenta
	tion --
	\$150,000--
	E A
	approved
	7/95.
(e)	Design
	criteria
	costs --
	Preparati
	on of the
	design
	criteria
	i s
	estimated
	to cost
	\$50,000.
(f)	Start-up costs
-- Estimated to cost \$130,000.	
b. Related annual costs	
1. Facility operating costs -- \$100,000 (includes maintenance, janitorial and utility services).	
2. Facility maintenance and repair costs -- None.	
3. Programmatic operating expenses directly related to facility materials (Programmatic Support) -- \$100,000 (includes materials, supplies and miscellaneous equipment related to facility operation (programmatic support)).	

1. Title and Location of Project:	Environmental Safety and Health Analytical
Laboratory	Project No.: 94-D-128
2a. Pantex Plant, Amarillo, Texas (Continued)	2 b .

Construction Funded

- 4. Capital equipment not related to construction but related to programmatic effort of the facility -- None.
- 5. GPP or other construction related to the programmatic effort -- None.
- 6. Utility costs -- None.
- 7. Other costs -- None.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project: Upgrade Life Safety, Kansas City Plant, Kansas City, Missouri	2a. Project No. 94-D-125
2b. Construction Funded	

SIGNIFICANT CHANGES

- None.

DEPARTMENT OF ENERGY
 FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
 (Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
 (Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project: Upgrade Life Safety, Kansas City Plant, Project No: 94-D-125	2a.
Kansas City, Missouri	2b.
Construction Funded	

3a. Date A-E Work Initiated: 2nd Qtr. FY 1994	5. Previous Cost Estimate:
\$14,700	Total Estimated Cost (TEC) --
3b. A-E Work (Titles I and II) Duration: 31 months	Total Project Cost (TPC) --
\$16,000	

4a. Date Physical Construction Starts: 4th Qtr. FY 1995	6. Current Cost Estimate:
	TEC -- \$14,700
4b. Date Construction Ends: 4th Qtr. FY 1998	TPC -- \$16,000

7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1994	\$ 1,000	\$ 0	\$ 1,000	\$ 16
1995	1,000	0	1,000	813
1996	5,500	0	5,500	1,616
1997	5,200	0	5,200	8,350
1998	2,000	0	2,000	3,905

8. Project Description, Justification and Scope

The Main Manufacturing Building and the Electrical Products Manufacturing Building of the Kansas City Plant (KCP) include approximately 2.3 million square feet and have an occupancy of approximately 3,400 personnel. This project is necessary to meet the intent of DOE Order 5480.7A, "Fire Protection," DOE Order 6430.1B, "General Design Criteria," and National Fire Protection Association (NFPA) 101, "Life Safety Code" standards. Among the upgrades that this project will provide are fire-rated separations which create exit enclosures in the main manufacturing and office buildings to allow personnel to safely evacuate the premises in case of a fire or other emergency. Modifications to existing walls and penetrations are included to provide fire-rated separations between office floors. Construction of horizontal exits and protected paths of travel to meet the required number of exits for office and factory personnel, and construction of fire-rated enclosures through the front office building to the outside are included. The project also includes modifications and upgrades to air handling units and ducts that provide air to exit passageways for the factory floor and in the basement. Further, this project will provide the necessary construction to upgrade existing walls and penetrations to meet the required fire-resistance rating for horizontal exits.

* FY 1998 funds will be used for procurement and construction activities.

1. Title and Location of Project, Plant,	2a. Kansas City, Missouri (Continued)	Upgrade Life Safety, Kansas City Project No: 94-D-125 2b.
Construction Funded		

8. Project Description, Justification and Scope (Continued)

The project will consist of the following work elements:

- | | | |
|--|-------------------------------------|--|
| 1. Direct Exterior Exits | 6. Eliminate Dead End Corridors | 11. Upgrade Horizontal Exits |
| 2. Additional Exit Capacity | 7. Upgrade Existing Exit Enclosures | 12. 50 percent Exits - First Floor Discharge |
| 3. Exits Within 250 Feet Travel Distance | 8. Exit Smoke Protection | 13. Redundant Sprinkler Supply |
| 4. Second Exit | 9. Unobstructed Exit Access | 14. Plenum Sprinklers |
| 5. Upgrade Second Exit | 10. Vertical Opening Protection | 15. Separate Hose Reels |

Deficiencies in life safety enclosures, exits, and air handling systems have been identified within the KCP main offices, manufacturing plant, and basement areas during the past several years. The lack of fire-rated separations and excessive travel distance to an exit from areas in the main facility per NFPA 101, Life Safety Code, 1991 Edition, Section 5-6, have been identified. Many deficiencies have been corrected as individual construction projects were completed; however, some aisle separations, exits, and air handling upgrades still require completion in areas where construction projects are not anticipated; therefore, this stand-alone project has been identified to correct these deficiencies.

Fire-rated separation for aisles needed as exit enclosures is necessary to meet the intent of DOE Order 5480.7A, "Fire Protection," DOE Order 6430.1B, "General Design Criteria," NFPA 101, "Life Safety Code," and Uniform Building Code (Chapter 33). Presently, air conditioning systems in the basement utilize exit enclosures for air supply and exhaust. Under a fire condition, this arrangement would allow smoke to enter the exit enclosure and prevent the enclosure from being used as an exit. Exit enclosures from which escape is to be made must be provided with fire-resistance-rated walls, floors, doors, or other means to provide occupants a protected path to the exterior of the building. Exit enclosures are not to be used as part of an air supply, return, or exhaust system serving other areas of the building. NFPA 101 and OSHA (Title 29. Part 1910) requirements are not met by existing conditions. Loss of life could result without appropriate protection. This project will provide the necessary construction to meet the intent of DOE Orders 5480.7A and 6430.1B that no fire will result in threats to the public health or in undue exposure of personnel. The July 1991 Headquarters Life Safety Appraisal recommends completion of the improvements of this project.

This project is in accordance with current mission needs, and is being coordinated with the Nonnuclear Reconfiguration project.

1. Title and Location of Project,
Plant, 2a.
Kansas City, Missouri (Continued)
Construction Funded

Upgrade Life Safety, Kansas City
Project No: 94-D-125
2b.

9. Details of Cost Estimate

	<u>Item Cost</u>	<u>Total</u>
<u>Cost</u>		
a. Design and Management Costs		\$ 1,485
(1) Engineering design and inspection at approximately 10.8 percent of construction costs, Item c (Design, Drawings, and Specifications)	\$ 1,155	
(2) Construction management costs	115	
(3) Project management at 2 percent of construction costs	215	
b. Land and land rights	0	
c. Construction costs		10,740
1. Improvements to land	0	
2. Buildings	9,015	
3. Special equipment	1,725	
4. Utilities	0	
5. Demolition	0	
d. Standard equipment		470
e. Major computer items		0
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout and acceptance		0
h. Subtotal (a through g)		\$ 12,695
i. Contingencies at approximately 15.8 percent of above costs		2,005
j. Total line item cost (Section 11.a.1.(a))		\$ 14,700
k. LESS: Non-Federal contribution		0
l. Net Federal total estimated cost (TEC)		<u>\$ 14,700</u>

10. Method of Performance

Design and inspection will be performed under KCP negotiated architect-engineer contracts. Construction will be by fixed-price contracts awarded after competitive proposals and administered by the KCP.

1. Title and Location of Project, Plant,	2a. Kansas City, Missouri (Continued)	Upgrade Life Safety, Kansas City Project No: 94-D-125 2b.
Construction Funded		

11. Schedule of Project Funding and Other Related Funding Requirements

	Prior Years FY 1998	FY 1995	Total	FY 1996	FY 1997	
a. Total project costs						
1. Total facility costs						
(a) Line item (Section 9.j.)	\$	16 \$	813 \$	1,616 \$	8,350 \$	3,905 \$ 14,700
(b) Plant, Engineering and Design (PE&D)		0	0	0	0	0
(c) Expense funded equipment		0	0	0	0	0
(d) Inventories	\$	0 \$	0 \$	0 \$	0 \$	0
Total facility cost (Federal and Non-Federal) \$	16 \$	813 \$	1,616 \$	8,350 \$	3,905 \$	14,700
2. Other project costs						
(a) R&D necessary to complete project		0	0	0	0	0
(b) Conceptual design costs		100	0	0	0	100
(c) Decontamination & Decommissioning (D&D)		0	0	0	0	0
(d) NEPA documentation costs		0	0	0	0	0
(e) Other project related costs		320	220	220	220	1,200
(f) Total other project costs	\$	420 \$	220 \$	220 \$	220 \$	1,300
(g) Total project costs	\$	436 \$	1,033 \$	1,836 \$	8,570 \$	4,125 \$ 16,000
(h) LESS: Non-Federal contribution		0	0	0	0	0
(i) Net Federal total project cost (TPC)	\$	436 \$	1,033 \$	1,836 \$	8,570 \$	4,125 \$ 16,000
b. Related annual costs						
1. Facility operating costs						\$ 0
2. Facility maintenance and repair costs						0
3. Programmatic operating expenses directly related to the facility						0
4. Capital equipment not related to construction but related to the programmatic effort in the facility						0
5. GPP or other construction related to the programmatic effort in the facility						0
6. Utility costs						0
7. Other costs						0
Total related annual funding						\$ 0

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

- a. Total project funding
1. Total facility costs
- Line item (a) -- construction line item costs for design, procurement, and construction at approximately \$14,700,000.
- (b) PE&D -- None.
- (c) Operating expense funded equipment -- None.
- (d) Inventories -- None.
2. Other project costs
- (a) R&D necessary to complete construction -- None.
- (b) A conceptual design report was completed in October 1991 at an estimated preparation cost of \$100,000.

1. Title and Location of Project, Plant,	2a. Kansas City, Missouri (Continued)	Upgrade Life Safety, Kansas City Project No: 94-D-125 2b.
Construction Funded		

(c) Decontamination & Decommissioning (D&D) -- No narrative required.
(d) NEPA documentation -- No narrative required.
Other ~~for~~ project related funding -- Approximately \$1,200,000 will be expended to develop appropriate documentation.

1. Title and Location of Project, Plant,	2a. Kansas City, Missouri (Continued)	Upgrade Life Safety, Kansas City Project No: 94-D-125 2b.
Construction Funded		

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements (continued)

b. Related Annual Funding		
1. Facility Operating Costs	\$	0
2. Facility Maintenance and Repair Costs		0
3. Programmatic operating expenses directly related to the facility		0
4. Capital equipment not related to construction but related to the programmatic effort in the facility		0
5. GPP or other construction related to the programmatic effort in the facility		0
6. Utility Costs		0
7. Other Costs		0
Total Related Annual Funding	\$	0

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DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project:Hydrogen Fluoride Supply System, Oak Ridge Y-12 Plant, Oak Ridge, Tennessee	2a.Project No. 94-D-124 2b.Construction Funded
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SIGNIFICANT CHANGES

- None.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project:	Hydrogen Fluoride Supply System,
2a. Project Number: 94-D-124	
Oak Ridge Y-12 Plant, Oak Ridge, Tennessee	2b.
Construction Funded	

3a. Date A-E Work Initiated (Title I Design): 1st Qtr. FY 1994	5. Previous Cost Estimate:
	Total Estimated Cost (TEC) --
\$26,300	
3b. A-E Work (Titles I and II) Duration: 18 months	Total Project Cost (TPC) --
\$28,820	

4a. Date Physical Construction Starts: 4th Qtr. FY 1995	6. Current Cost Estimate:
	TEC -- \$26,300
4b. Date Construction Ends: 1st Qtr. FY 1999	TPC -- \$28,820

7. Financial Schedule (Federal Funds):

Fiscal Year	Appropriations	Adjustments	Obligations	Costs
1994	\$ 5,000	\$ 0	\$ 5,000	\$ 813
1995	6,300	0	6,300	4,137
1996	8,700	0	8,700	4,398
1997	4,900	0	4,900	10,400
1998	1,400	0	1,400	4,176
1999	0	0	0	2,376

8. Project Description, Justification and Scope

The scope of this project is to provide replacement anhydrous fluoride (AHF) supply and fluidbeds facilities, both of which are part of the existing enriched uranium recycle and conversion facilities in the Oak Ridge Y-12 Plant. The hydrogen fluoride (HF) facility, Fluidbeds, and reconfigured HF supply system will be located on the east side of 9212 building adjacent to the existing HF dock. This configuration will allow elimination of the documentation and demolition of existing 9812 building because of overlapping footprints between the proposed facility and the existing facility. The HF Facility will be enclosed in three process modules which will contain all potential HF releases. The replacement fluidbeds will be located in the east end of existing B-1 Wing of the 9212 building which will be remodeled for this

1. Title and Location of Project:	Hydrogen Fluoride Supply System, Oak
Ridge	Project Number: 94-D-124
2a.	2b.
Y-12 Plant, Oak Ridge, Tennessee (Continued)	
Construction Funded	

function. The new HF supply system and the fluidbeds will be designed to be operated remotely as current technology permits.

The new HF system will include new hydrogen fluoride cylinder handling, vaporization and delivery piping systems, cylinder and vaporizer containment modules, automated control and leak detection system; and an HF pressure relief, fugitive emissions, and emergency release collection and treatment system module. AHF is one of the most acidic substances known and does not biodegrade when released in water, in air, or on land. It must be buffered, diluted, or reacted to reduce its acidity. Exposure to an air concentration of 30 parts per million can be immediately dangerous to life and health and, even in lower air concentration, can produce severe irritation to the eyes, skin, and respiratory system. HF will be received at the existing HF dock in vendor-owned cylinders and trucks. The fluidbeds facility, which converts

1. Title and Location of Project:	Hydrogen Fluoride Supply System, Oak Ridge
2a.	Project Number: 94-D-124
Y-12 Plant, Oak Ridge, Tennessee (Continued)	2b.
Construction Funded	

8. Project Description, Justification and Scope (Continued)

uranium oxide to fluoride, will include the installation of reduction and hydrofluorination fluidbed vessels, supporting facilities, vessel off-gas treatment system, transfer system, and process exhaust systems. The new HF supply system will utilize an existing dock on the east side of the existing enriched uranium recycle facility. This site is adjacent to the existing HF supply facility. The new facility will utilize existing HF treatment solution, potassium hydroxide (KOH), storage tanks and their tanker stations. The new fluidbed system will be constructed in the east portion of building 9212 B-1 Wing. The project includes demolition of the existing area including a mezzanine, partitions, stairways, miscellaneous structures, and the resulting containerization and disposal of contaminated waste on a Y-12 Plant site interim waste storage pad.

Failure to complete this project will continue the risk of unacceptable HF exposures to the public, worker population, and the operators, with the latter bearing an additional risk of uranium particulate inhalation exposure. In addition, failure to fund this project would jeopardize continued operation of the HF supply and fluidbeds facilities, and, thereby, the only DOE complex highly enriched uranium conversion and recycle complex.

A major release of HF is the Y-12 Plant's greatest hazard, other than a nuclear criticality. The proposed new HF facility replaces an existing, essentially open-air cylinder unloading and vaporization dock which is operated in a "hands on" manner. The existing dock does not have fugitive and purging emission treatment capability, nor is it capable of dealing with a major release caused by a severe natural phenomena event. The new facility is required to sufficiently reduce the risk of an unacceptable exposure to the operator, the worker population, the public, and reduce the risk of an associated detrimental environmental impact.

The fluidbeds facility, where the HF is reacted with uranium oxide, was constructed more than 30 years ago. The age of this facility is making it increasingly difficult to maintain compliance with current and anticipated contamination control, safety, and regulatory requirements. The major improvements required can most efficiently be achieved by total replacement. Design features of the new facility will dramatically reduce the risk of HF and uranium particulate exposures to the operators. The proposed replacement facilities will assure the capability of highly enriched uranium metal production for the long term or until a totally new uranium weapons production capability (complex 21) can be constructed and is operable. (The replacement of these facilities would result in the entire uranium processing complex at Y-12 being for the most part either replaced or modernized.)

The highly enriched uranium chemical recovery and recycle process continues to be necessary and a unique Y-12 capacity to fulfill the following missions: (1) maintaining nuclear competence and providing requested specification grade uranium for weapons component fabrication and other special needs; (2) providing conversion capability of uranium salvage from retired weapons to alternate forms (such as metal or oxide) which are more readily accountable and allow safe storage from a health physics and criticality safety standpoint; (3) serving as a national repository for highly enriched uranium and, therefore, having the conversion capability to economic, safe, and accountable uranium forms for long-term storage.

* FY 1998 funds will be used to complete the procurement of the modules, complete site preparation, demolition and modifications, and complete facility utility upgrades and support construction management and Title III inspection services.

1. Title and Location of Project:	Hydrogen Fluoride Supply System, Oak Ridge
2a.	Project Number: 94-D-124
Y-12 Plant, Oak Ridge, Tennessee (Continued)	2b.
Construction Funded	

9. Detail of Cost Estimate

<u>Cost</u>	<u>Item Cost</u>	<u>Total</u>
a. Design and Management Costs		\$ 5,360
(1) Engineering, design and inspection at approximately 30% of construction costs (Item c)	\$ 4,870	
(2) Construction management costs	40	
(3) Project management at 3 percent of construction costs (Item c)	450	
b. Land and land rights		0
c. Construction costs		16,390
1. Improvements to land	\$ 250	
2. Buildings	4,400	
3. Special equipment	11,380	
4. Utilities	0	
5. Other Structures	360	
6. Demolition	0	
d. Standard equipment	0	
e. Major computer items	0	
f. Removal cost less salvage	0	
g. Design and project liaison, testing, checkouts and acceptance		510
h. Subtotal (a through g)		\$ 22,260
i. Contingencies at approximately 18.1 percent of above costs		4,040
j. Total line item cost (Section 11.a.1.(a))		\$ 26,300
k. LESS: Non-Federal contribution		0
l. Net Federal total estimated cost (TEC)		<u>\$ 26,300</u>

10. Method of Performance

Engineering will be performed under one negotiated architect-engineer contract (demolition and utilities and facility modifications) and Lockheed Martin Energy Systems (LMES) cost plus award fee (CPAF) contract for engineering of the special process flow sheets and module designs for the new systems. Construction of the new HF and fluidbed systems, including demolition activities, will be accomplished by the construction manager's direct-hire (CPAF) forces due to contamination and close proximity of fissile material access areas and ongoing operations. An interim storage pad for B-25 boxes will be constructed by a fixed-price subcontractor.

1. Title and Location of Project:	Hydrogen Fluoride Supply System, Oak Ridge
2a. Y-12 Plant, Oak Ridge, Tennessee (Continued)	Project Number: 94-D-124
Construction Funded	2b.

11. Schedule of Project Funding and Other Related Funding Requirements

	Prior Years FY 1999	FY 1995	Total	FY 1996	FY 1997	FY
1998						
a. Total project costs						
1. Total facility costs						
(a) Line Item (Section 9.j.)	\$	813 \$	4,137 \$	4,398 \$	10,400 \$	4,176 \$ 2,376
\$ 26,300						
(b) Plant, Engineering and Design		0	0	0	0	0
0						
(c) Operating expense funded equipment		0	0	0	0	0
0						
(d) Inventories		0	0	0	0	0
0						
(e) Total facility costs (Federal and Non-Federal)	\$	813 \$	4,137 \$	4,398 \$	10,400 \$	4,176 \$ 2,376
\$ 26,300						
2. Other project costs						
(a) R&D necessary to complete project		0	0	0	0	0
0						
(b) Conceptual design and Site characterization costs		375	0	0	0	0
375						
(c) Design criteria costs		170	0	0	0	0
170						
(d) . . Decontamination and Decommissioning (D&D)		0	0	0	0	0
0						
(e) Safety documentation costs		50	0	0	0	0
50						
(f) NEPA documentation costs		50	0	0	0	0
50						
(g) Other project related costs		635	240	250	375	190 185
1,875						
(h) Total other project costs	\$	1,280 \$	240 \$	250 \$	375 \$	190 \$ 185
\$ 2,520						
(i) Total project costs \$	2,093 \$	4,377 \$	4,648 \$	10,775 \$	4,366 \$	2,561 \$ 28,820
(j) LESS: Non-Federal contribution		0	0	0	0	0
0						
(k) Net Federal total project cost (TPC)	\$	2,093 \$	4,377 \$	4,648 \$	10,775 \$	4,366 \$ 2,561
\$ 28,820						
b. Related annual costs (estimated life of project--30 to 40 years)						
1. Facility operating costs						\$ 20
2. Facility maintenance and repair						960
3. Programmatic operating expenses directly related to the facility						0

1. Title and Location of Project:	Hydrogen Fluoride Supply System, Oak
Ridge	Project Number: 94-D-124
2a.	2b.
Y-12 Plant, Oak Ridge, Tennessee (Continued)	

Construction Funded

4.	Capital equipment not related to construction but related to the programmatic effort in the facility	0
5.	GPP or other construction related to programmatic effort in the facility	0
6.	Utility costs	0
7.	Other costs	0
	Total related annual costs	<u>\$</u>

1. Title and Location of Project:		Hydrogen Fluoride Supply System, Oak
Ridge	2a.	Project Number: 94-D-124
	Y-12 Plant, Oak Ridge, Tennessee (Continued)	2b.
Construction Funded		

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

a.	Total project funding		
1.	Total facility costs		
	(a)		Line Item -- Costs for the Engineeri ng Design, Procureme nt, Demolitio n, and Construct ion of the HF Supply System are Estimated at \$26,300,0 00.
None.	(b)	PE&D --
	(c)		Operating expense funded equipment -- None.
	(d)	
	Inventories --	None.	
2.	Other project costs		
	(a)	R&D
necessary	to complete construction --	Costs will not be required.	
	(b)		Conceptua l design and Site character ization costs -- \$375,000

1. Title and Location of Project: Ridge	2a. Y-12 Plant, Oak Ridge, Tennessee (Continued)	Hydrogen Fluoride Supply System, Oak Project Number: 94-D-124 2b.
Construction Funded		

(c)	have been incurred to develop the original scope of the project and to improve the project cost and schedule estimates.
(d)	Decontamination and Decommissioning (D&D) -- None.
criteria -- Approximately \$170,000 will be expended.	Design
(e)	Safety documentation costs -- Approximately \$50,000 will be incurred to prepare safety analysis.
(f)	NEPA
Documentation -- Approximately \$50,000 will be expended.	
(g)	Other project related

1. Title and Location of Project:		Hydrogen Fluoride Supply System, Oak Ridge
	2a.	Project Number: 94-D-124
	Y-12 Plant, Oak Ridge, Tennessee (Continued)	2b.
Construction Funded		

funding -
-
Approximately
\$1,875,000 will be expended.
It is broken out as follows:
Plant Support for duration of project, \$800,000; Startup Operations, \$585,000; and Feasibility Study, Systems Requirement, Value Engineering, \$445,000. Site Characterization, \$45,000.

b. Related annual costs (estimated life of project--30 years)

1. Facility operating costs -- The utilities, maintenance and materials, and associated overhead for facility operating costs will cost approximately \$20,000 annually.
2. Facility maintenance and repair costs -- The annual costs for direct labor, materials and supplies, and associated overhead for maintenance and repair activity are estimated to cost approximately \$960,000.
3. Programmatic operating expenses directly related to the facility -- None.
4. Capital equipment not related to construction but related to the programmatic effort in the facility -- None.

1. Title and Location of Project:	Hydrogen Fluoride Supply System, Oak
Ridge	Project Number: 94-D-124
2a.	2b.
Y-12 Plant, Oak Ridge, Tennessee (Continued)	
Construction Funded	

- 5. GPP or other construction related to the programmatic effort in the facility -- None.
- 6. Utility costs -- None.
- 7. Other Costs -- None.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

<p>1. Title and Location of Project: Nonnuclear Reconfiguration, Complex-21, Various Locations</p> <hr style="border-top: 1px dashed black;"/> <p>3a. Date A-E Work Initiated: 3rd Qtr. FY 1993</p> <p>3b. A-E Work (Title I & II) Duration: Ongoing</p> <hr style="border-top: 1px dashed black;"/> <p>4a. Date Physical Construction Starts: 2nd Qtr. FY 1994</p> <p>4b. Date Construction Ends: 3rd Qtr. FY 1998</p> <p>7. <u>Financial Schedule (Federal Funds):</u></p>	<p>2A Project No.: 93-D-123 2b. construction Funded</p> <hr style="border-top: 1px dashed black;"/> <p>5. Previous Cost Estimate: Total Estimated Cost (TEC) \$163,860 Total Project Cost (TPC) \$198,063</p> <hr style="border-top: 1px dashed black;"/> <p>6. Current Cost Estimate: TEC -- \$161,860 TPC -- \$196,063</p>
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<u>a/</u>	<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
	1993	\$ 26,000	\$ 0	\$ 26,000	\$ 171
	1994	25,000	0	25,000	12,309
	1995	58,000	0	58,000	39,599
	1996	41,065	(2,692) <u>b/</u>	38,373	48,648
	1997	14,487	0	14,487	58,627
	1998	0	0	0	2,506

a/ Utilization of FY 1993 and FY 1994 funds was impeded due to unexpected events dramatically affecting project execution and, thereby, resulting in significant carryover and reutilization of FY 1993 appropriations in FY 1994 and FY 1995. Planned activities were significantly delayed and altered due to delays in finalizing the NEPA FONSI, mission changes due to the June 1992 Bush-Yeltsin Agreement (START II Treaty of 1/93), as well as supplemental Congressional studies, requested prior to utilization of funds and associated with dual need equipment.

b/ \$2,692,000 used for FY 96 budget reduction.

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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8. Project Description, Justification, and Scope

As a result of new mission requirements, the Nuclear Reconfiguration activities have been deleted from this project.

Due to mission downsizing, the construction end date changed from 1st Qtr FY 2001 to 3rd Qtr FY 1998.

"Complex-21" is the Department of Energy's designation for a reconfigured nuclear weapons complex which will provide the nuclear weapons to support the Nation's nuclear deterrent policy through the middle of the next century. The mission of the Nuclear Weapons Complex is now focused on ensuring the viability of the enduring nuclear weapons stockpile. This requires the DOE to support four major activities: (1) limited life component exchanges; (2) the Stockpile Evaluation Program; (3) repairing or replacing weapons components as needed; and (4) upgrading to improve stockpile safety, security, and reliability.

The Nonnuclear Reconfiguration Project involves consolidating the activities from three donor sites, the Mound, Pinellas, and Rocky Flats (RF) plants, into five receiver sites; the Kansas City Plant (KCP), the Sandia National Laboratories/New Mexico (SNLNM), the Los Alamos National Laboratory (LANL), Lawrence Livermore National Laboratory (LLNL), and the Savannah River Site (SRS).

The current Complex comprises 11 government-owned, contractor-operated major facilities, distributed over 10 states. Many of them were constructed 30-40 years ago, were sized to meet programmatic workloads substantially larger and more diverse than those expected in the future, and were designed and built to standards and regulations very different and less stringent than those of today.

In January 1991, the then Secretary of Energy announced that the Department would prepare a programmatic environmental impact statement (PEIS) examining alternatives for the reconfiguration of the nuclear weapons complex (the Complex). The framework for the Reconfiguration PEIS was described in the January 1991 Nuclear Weapons Complex Reconfiguration Study, a detailed examination of alternatives for the future Complex. Because of the significant changes in the world since January 1991, especially with regard to projected future requirements for the United States' nuclear weapons stockpile, the Department has concluded that the framework described in the Reconfiguration Study does not exist today. Contributing factors to this conclusion include public comment at the September-October 1993 PEIS scoping meetings, the fact that no new nuclear weapons production is required for the foreseeable future, budget constraints, and the Department's decision to prepare a separate PEIS on Storage and Disposition of Weapons-Usable Fissile Nuclear Materials. As a result of these changed circumstances, the Department separated the Reconfiguration PEIS into two separate PEIS documents: a Tritium Supply and Recycling PEIS which was completed in October 1995, and a Stockpile Stewardship and Management PEIS to be completed in December 1996.

Consistent with the Secretary of Energy's Record of Decision (ROD), announced on December 6, 1995, the Department is proceeding with a dual-track strategy to assure a future tritium source. One track will explore the purchase of an operating or partially complete Commercial Light Water Reactor (CLWR). The second track will be to design, build, and test critical components of an accelerator system for production of tritium (APT). Both the CLWR and APT options will be developed through 1998 before a down-selection of the preferred technology is undertaken. As part of the ROD, if an APT facility is built, it will be located at the Savannah River Site (SRS), and an extraction facility for CLWR targets would also be built at SRS.

Consolidation of the nonnuclear manufacturing is separate from the above PEIS efforts and was evaluated separately utilizing an Environmental Assessment which resulted in a Finding of No Significant Impact (FONSI) in September 1993.

1.	Title and Location of Project:	Nonnuclear Reconfiguration,
Complex-21,	2a.	Project No.: 93-D-123
	Various Locations	2b. Construction Funded

The Nonnuclear Reconfiguration project will consolidate the nonnuclear portion of the nuclear weapons production complex.

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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8. Project Description, Justification, and Scope (continued)

An Environmental Assessment (EA) for reconfiguration of the nonnuclear manufacturing facilities was developed separately from the PEIS. It was distributed to the affected states and Indian Tribes for pre-approval review and comment in December 1992. In early 1993, the Cost Effectiveness Report on nonnuclear reconfiguration was submitted to Congress in response to the requirement contained in the Energy and Water Development Appropriations Act for FY 1993 and the National Defense Authorization Act for FY 1993. Three independent consultants were appointed by Secretary O'Leary to evaluate the findings and analysis that supported the cost effectiveness certifications. Their reports were delivered to the Secretary on May 24, 1993, and concluded that the proposed reconfiguration was cost effective and reasonable and that it would not increase the technological environmental, safety, or health risks associated with Departmental facilities. On May 27, 1993, the Secretary announced her decision to proceed with the Environmental Assessment and to publish a proposed Finding of No Significant Impact (FONSI) in the Federal Register, with implementation of the preferred plan to occur after the two events had taken place. A FONSI was issued for the project on September 8, 1993. The plan calls for the consolidation of most nonnuclear activities at the KCP with a few activities assigned to the weapons laboratories to preserve technology. Tritium work presently done at the Mound Plant would be relocated to the Savannah River Site. Reconfiguration of the nonnuclear weapons manufacturing activities is needed to maintain key technologies associated with the design and manufacture of nonnuclear weapons components required to support the enduring stockpile. The collocation of these technologies provides the mechanism to exercise and retain the special skill base necessary to produce and test replacement components.

The Nonnuclear Reconfiguration Project will transfer production operations from Mound Plant (MD), Pinellas Plant (PP), and Rocky Flats to Kansas City Plant, Sandia National Laboratories, Savannah River, Los Alamos National Laboratory, and Lawrence Livermore National Laboratory.

SNL will be receiving the following product lines: Neutron Generators Assembly, Milliwatt Heat Source Surveillance (MWHS), High Power Detonators, and Thermal Battery Technologies. SNL will assume surveillance activities for 28 SNL designed components.

KC will be receiving the following product lines: Flat Cable Products, Mechanical Assemblies, Roundwire Detonator Cables/Plastic Headers, Nonnuclear ACORN, Support Pads, Optoelectronics Assemblies, Neutron Detectors, Lightning Arrestor Connectors, Transducers, Reservoir Assemblies and Testing, Nuclear Grade Steel, Safe Secure Trailers, Metrology Services, Sitewide Tasks/Miscellaneous Equipment and Document Storage.

LANL will be receiving the following product lines: Beryllium Technology, Pit Support, Neutron Tube Target Loading, High Power Detonators, Flat Cable Products, and ICF Target Loading. LANL will assume surveillance activities for 13 LANL designed components.

LLNL will assume surveillance activities for 12 LLNL designed components.

SR will receive the following product lines: Gas Transfer Systems, and Reservoir Surveillance Operations.

Incorporation of these product lines into KC, SNL, LANL, LLNL, and SR facilities will be accomplished by rearranging and upgrading space within existing buildings, transferring equipment from the donor sites, purchasing new product equipment, installation of some of the transferred and new equipment and associated support systems (record storage, etc.). Due to production schedules and other time constraints interim equipment staging and testing may precede final equipment placement and the capital interim activities associated with final placement.

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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The availability of adequate facilities, the ability to rearrange the existing manufacturing buildings, experience in a variety of product and procurement activities, minimal environmental concerns, and an excellent technical personnel base positions the complex to fulfill their role in nonnuclear manufacturing. To consolidate nonnuclear manufacturing at these locations, funding is required to support construction, rearrangements, procurement, transfer of existing equipment, and installation, as required to accommodate transferred product.

8. Project Description, Justification, and Scope (Continued)

Technology Total Cost includes "donor" and "receiver" capitalized cost at all locations discussed below.

SANDIA NATIONAL LABORATORIES - PRODUCTS TRANSFERRED FROM PINELLAS AND MOUND PLANT: TEC - \$54,119,000

Subproject 01: Neutron Generators Facilities (NGF): TEC - \$49,591,000

<u>TEC</u>	<u>Previous</u> <u>S</u>	<u>FY 1996</u>	<u>FY</u> <u>1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u> <u>Dates</u>
\$ 49,591	\$ 35,749	\$ 13,842	\$ 0	\$ 0	\$ 0	Subproject completed

TEC decreased from \$51,731,000 to \$49,591,000. TEC decrease results from mission requirement and estimate refinement.

NGF will have a prototyping, production, and delivery capability for neutron generators with initial shipments beginning in FY 1999. The facility will be sized to meet current Planning and Production Directive schedules with a single shift.

The design strategy is to use and renovate existing buildings to accommodate the functional requirements of the NGF. Eight existing Buildings (870, 842, 860, 878, 882, 891, 6730, and 905) have been identified as part of the NGF. All buildings are located in Tech Area I, except 6730 and 905; and all buildings are located within a "limited access" area. The primary building for NGF (Building 870) will be renovated and utilized to satisfy the NGF design and prototyping requirements. The scope of work for Building 870 includes demolition and reconstruction of the entire north wing. Portions of the other existing buildings identified above will also be utilized by the NGF although only minor construction and equipment relocations will be necessary.

Subproject 02: Cap Assemblies: TEC - \$1,353,000

<u>TEC</u>	<u>Previous</u> <u>S</u>	<u>FY 1996</u>	<u>FY</u> <u>1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u> <u>Dates</u>
\$ 1,353	\$ 1,353	\$ 0	\$ 0	\$ 0	\$ 0	Subproject terminated

Subproject 03: Milliwatt Heat Source Surveillance and Thermal Battery Technologies: TEC - \$2,526,000

<u>TEC</u>	<u>Previous</u> <u>S</u>	<u>FY 1996</u>	<u>FY</u> <u>1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u> <u>Dates</u>
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1.	Title and Location of Project:	Nonnuclear Reconfiguration,
Complex-21,	2a.	Project No.: 93-D-123
	Various Locations	2b. Construction Funded

8. Project Description, Justification, and Scope (continued)

Site work will include the removal of the large argon and nitrogen tanks and associated concrete equipment pads, concrete steps and landings, gas bottle storage area, and vacuum pump. A new gas bottle storage facility will be constructed along with a new concrete loading dock and stairs, concrete ramps, and hazardous materials storage room. Building will be designed with all applicable codes and standards.

Subproject 04: High Power Detonators: SNL/N.M.: TEC - \$649,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>s</u>					<u>Dates</u>
\$ 649	\$ 649	\$ 0	\$ 0	\$ 0	\$ 0	Subproject Completed

TEC decreased from \$849,000 to \$649,000. TEC decrease results from mission requirement and estimate refinement.

The transfer of HE Component Surveillance activities from Mound is documented in the High Power Detonator Activity Transfer Plan. The SNL/N.M.-specific HE Component Surveillance activities are directly linked to the LANL High Power Detonator activity transfer. Surveillance activities involve twenty-eight SNL/N.M. components. A HQ programmatic decision has been made to have the surveillance activities reside at the design laboratory responsible for each specific component. Incorporation of this product line will be accomplished by rearranging and upgrading space within existing facilities, and purchasing new product equipment.

LAWRENCE LIVERMORE NATIONAL LABORATORY - PRODUCTS FROM MOUND: TEC - \$150,000

Subproject 05: High Power Detonators: LLNL: TEC - \$150,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>s</u>					<u>Dates</u>
\$ 150	\$ 150	\$ 0	\$ 0	\$ 0	\$ 0	Subproject Completed

TEC decreased from \$450,000 to \$150,000. TEC decrease results from mission requirement and estimate refinement.

The transfer of HE Component Surveillance activities from Mound is documented in the High Power Detonator Activity Transfer Plan. The LLNL-specific HE Component Surveillance activities are directly linked to the LANL High Power Detonator activity transfer. Surveillance activities involve twelve LLNL components. A HQ programmatic decision has been made to have the surveillance activities reside at the design laboratory responsible for each specific component. Incorporation of this product line will be accomplished by rearranging and upgrading space within existing facilities, and purchasing new product equipment.

KANSAS CITY PLANT - PRODUCTS TRANSFERRED FROM MOUND PLANT: TEC - \$6,945,000

Subproject 06: Flat Cable Products: TEC - \$555,000

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>s</u>		<u>1997</u>			<u>Dates</u>
\$ 555	\$ 555	\$ 0	\$ 0	\$ 0	\$ 0	Subproject Completed

An approximate 1,000 square feet of space is required for the Flat Cable technology that will be located within the Main Manufacturing

8. Project Description, Justification, and Scope (continued)

Building. The Project rearranges an existing department and builds a new wall to separate this department from the Flat Cables area. Intermediate partitions, some lights, sprinkler heads, utility piping and duct-work will be relocated or added. Procurement will consist of the transfer of donor site equipment.

Facility space will be provided in vacant areas to allow initiation of development work and staging of equipment prior to the preparation of final facility space. This is required to move the technology prior to the cessation of donor site activities. The KCP will be responsible for cable production and PVD bridge.

Subproject 07: Mechanical Assemblies: TEC - \$1,195,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>s</u>		<u>1997</u>			<u>Dates</u>
\$ 1,195	\$ 1,195	\$ 0	\$ 0	\$ 0	\$ 0	Subproject Completed

An approximate 2,200 square foot area is required for this technology. Modification to an existing Class 100,000, clean room is required to provide space for some of the transferred MD equipment. Procurement consists of deionization grids which will be installed on existing clean benches. Rearrangements are also required within the existing Class 100,000, clean room and a laser welder room to establish this capability. The rearrangements consist of relocating existing equipment and modification of utilities.

Subproject 08: Roundwire Detonator Cables/Plastic Headers: TEC - \$655,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>s</u>		<u>1997</u>			<u>Dates</u>
\$ 655	\$ 655	\$ 0	\$ 0	\$ 0	\$ 0	Subproject Completed

An approximate area of 1,000 square feet is required for this technology. There is no construction required to establish this capability. Procurement consists of shape and slot machines, resistance welder, ultrasonic welder, vacuum oven, and portable desiccator chamber. Minor rearrangements are required to establish transferred equipment on existing workbenches with existing departments at KC.

Subproject 09: Nonnuclear ACORN: TEC - \$4,540,000

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>s</u>		<u>1997</u>			<u>Dates</u>
\$ 4,540	\$ 4,540	\$ 0	\$ 0	\$ 0	\$ 0	Subproject Completed

An approximate area of 1,500 square feet is required for this technology. Facility space will be provided in vacant factory areas to allow initiation of development work and staging of equipment prior to the preparation of final facility space. This is required to move the technology prior to the cessation of donor site activities. Equipment to be procured includes: assembly equipment, glove boxes, ultrasonic cleaner, vacuum bake station, welder, flow tester, and lab equipment. Area rearrangement consists primarily of relocation of equipment, and modification to utilities.

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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8. Project Description, Justification, and Scope (continued)

KANSAS CITY PLANT - PRODUCTS TRANSFERRED FROM PINELLAS PLANT: TEC - \$1,587,000

Subproject 10: Lithium Ambient Batteries (LAMB): TEC - \$0

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion Dates</u>
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	Deleted from KC Mission

Subproject 11: Support Pads: TEC - \$320,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion Dates</u>
\$ 320	\$ 320	\$ 0	\$ 0	\$ 0	\$ 0	Subproject Completed

An approximate area of 460 square feet is required for this technology. There will be no construction activity or procurement of new capital equipment required to establish this capability at KC. The Support Pads will be molded/foamed within the existing foam molding department. Minor rearrangement will be required within an existing welding department to transfer the flame spray process.

Subproject 12: Optoelectronics Assemblies: TEC - \$180,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion Dates</u>
\$ 180	\$ 180	\$ 0	\$ 0	\$ 0	\$ 0	Subproject Completed

An approximate area of 800 square feet is required for this technology. Work will consist of only obtaining from the donor site and storing the transferred equipment at the Kansas City Plant.

Subproject 13: Neutron Detectors: TEC - \$57,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion Dates</u>
\$ 57	\$ 57	\$ 0	\$ 0	\$ 0	\$ 0	Subproject Completed

An approximate area of 700 square feet is required for this technology. Transferred equipment and utilities will be rearranged as required to install transferred equipment.

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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8. Project Description, Justification, and Scope (continued)

Subproject 14: Lightning Arrestor Connectors: TEC - \$940,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>s</u>		<u>1997</u>			<u>Dates</u>
\$ 940	\$ 940	\$ 0	\$ 0	\$ 0	\$ 0	Subproject Completed

An approximate area of 3,300 square feet is required for this technology. Construction includes building a 300 square foot Lead Titinate room for the handling of lead in the Materials Engineering Laboratory. A 250 square foot Class 100 clean room will be purchased and installed to support LAC production equipment located in the Electrical Products Manufacturing Building (EPMB). Lead Titinate equipment will not be transferred to KC due to lead contamination. New equipment will be procured for Lead Titinate including a flammable cabinet, rolling machine, hooded sink, shelves, ovens, benches and hoods. Equipment presently occupying the project locations will be moved or excessed.

Subproject 15: Transducers: TEC - \$90,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>s</u>		<u>1997</u>			<u>Dates</u>
\$ 90	\$ 90	\$ 0	\$ 0	\$ 0	\$ 0	Subproject Completed

An approximate area of 500 square feet is required for this technology. There will be no construction activity required to establish this capability at KC. A rearrangement of an existing KC 3-bay tester, a 2-bay tester, two single bay testers, one desk, and existing sputtering equipment will be required to provide space for the equipment relocated from PP and equipment being purchased.

KANSAS CITY PLANT - PRODUCTS TRANSFERRED FROM ROCKY FLATS PLANT: TEC - \$29,271,000

Subproject 16: Reservoir Assemblies and Testing: TEC - \$17,163,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>s</u>		<u>1997</u>			<u>Dates</u>
\$ 17,163	\$ 15,738	\$ 1,425	\$ 0	\$ 0	\$ 0	2nd Qtr. FY 1994 - 2nd Qtr. FY 1997

An approximate area of 29,700 square feet is required for this technology. Approximately 1,600 square feet containing wood block flooring will be removed and treated as hazardous waste. The site preparation work for this facility will include the demolition and removal of metal clad gypsum board and coreboard partitions and removal of steel mesh crib security fencing. The concrete factory floor in the Heavy Machining Department will also be removed and replaced. New construction will include installation of metal stud and gypsum board partitions and enclosures, acoustical ceilings, resilient flooring, and hollow metal doors and frames. The new construction will also include a 12-inch thick reinforced concrete factory floor in part of the area, structural steel framing for equipment platforms, bridge cranes, and reinforced concrete containment sumps to capture effluent from cleaning lines.

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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The metal stud and gypsum board construction will provide rooms and partition walls to house coordinate measuring machines, general inspection area, cleaning lines, ancillary machining equipment, a metallurgical lab, and a swaging operation. Procurement will consist of a laser marker, engine lathe, tool presetter, crush grinder, rotary swager, tube bender, electro-chemical marker, pinch welder, heat oven, vacuum braze furnace, ultrasonic testing equipment, machining accessories, X-ray system, tube testers, leak testers, and miscellaneous equipment.

1.	Title and Location of Project:	Nonnuclear Reconfiguration,
Complex-21,	2a.	Project No.: 93-D-123
	Various Locations	2b. Construction Funded

8. Project Description, Justification, and Scope (continued)

Facility space will be provided in vacant factory areas to allow initiation of development work and staging of equipment prior to the preparation of final facility space. This is required to move the technology prior to the cessation of donor site activities.

Subproject 17: Nuclear Grade Steel/Oxnard: TEC - \$1,159,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u> <u>Dates</u>
\$ 1,159	\$ 1,159	\$ 0	\$ 0	\$ 0	\$ 0	Subproject Completed

An approximate area of 8,800 square feet is required for this technology. Installation of a bridge crane is required. Site work involved will require removal and replacement of the factory floor to accommodate the capability. Excavation and compaction of the footing sub-grade will also be required. Procurement will consist of a band saw, tube scanner, bar tester, and storage racks. Rearrangement within the existing vacant area will consist of modifications to existing utility systems. Facility space will be provided in vacant areas to allow for interim storage of steel because of earlier closure date at the donor site.

Subproject 18: Safe Secure Trailers: TEC - \$10,949,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u> <u>Dates</u>
\$ 10,949	\$10,949	\$ 0	\$ 0	\$ 0	\$ 0	Subproject Completed

An approximate area of 29,400 square feet is required for this technology. The Forge and Casting building will be modified to accommodate trailer production. An existing concrete masonry unit wall will be demolished. Five ton capacity bridge cranes with supporting steel structures will be installed. Paint booth and other processes will require new exhaust systems. An office and a foam/lytherm application area will be constructed. A basement area will be renovated to provide restrooms, break area, and locker room. An 8 foot partitioned area will be constructed for handling explosives. The area will be provided with the necessary alarms and hardware for a limited access area. Equipment to be procured includes welders, lifts, cutting equipment, sheet metal equipment, miscellaneous small tools for trailer work, office furniture and locker room accessories. Approximately 13,000 square feet of storage racks and contents will be relocated to provide space for Safe Secure Trailers.

Subproject 19: Weapon Trainer Shop: TEC - \$0

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u> <u>Dates</u>
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	Deleted from KC Mission

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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8. Project Description, Justification, and Scope (continued)

Subproject 20: Metrology Services: TEC - \$0

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion Dates</u>
\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	Existing facilities and equipment at KC will be used.

There are no facilities or equipment required to transfer Metrology Services to KC. Existing facilities and equipment at KC will be used. There are no costs associated with the transfer of this technology.

KANSAS CITY PLANT - SITEWIDE TASKS: TEC - \$3,249,000

Subproject 21: Sitewide Tasks/Miscellaneous Equipment and Document Stores: TEC - \$3,249,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion Dates</u>
\$ 3,249	\$ 1,144	\$ 2,105	\$ 0	\$ 0	\$ 0	4th Qtr. FY 1994 - 3rd Qtr. FY 1997

Miscellaneous Equipment: In addition to the items identified for each technology to be transferred to the KCP, there are many items of miscellaneous equipment required. These multiple use items are required to produce the additional products transferred to the KCP but cannot be identified against a specific technology.

Document Storage: Documentation on existing products at donor sites will be relocated to the KCP and may require the preparation of suitable space.

LOS ALAMOS NATIONAL LABORATORY - PRODUCTS TRANSFERRED FROM MOUND PLANT: TEC - \$4,520,000

Subproject 22: High Power Detonators and Flat Cable Products: TEC - \$3,320,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion Dates</u>
\$ 3,320	\$ 2,989	\$ 331	\$ 0	\$ 0	\$ 0	4th Qtr. FY 1994 - 3rd Qtr. FY 1998

TEC decreased from \$4,750,000 to \$3,320,000. TEC decrease results from mission requirement and estimate refinement.

To support the transfer of High Power Detonator activities to LANL, minor modifications to Building 16-340 and an explosive storage magazine will be made. The required process equipment will be relocated from MD where practical and the balance will be acquired through new procurement.

LANL will be responsible for fabricating stated bridges, bonding of bridges and cables, and test fire. No additional floor space will be required, only minor modifications to existing facilities is required. These mission assignments were transferred from the KC Flat Cable Products mission scope.

1.	Title and Location of Project:	Nonnuclear Reconfiguration,
Complex-21,	2a.	Project No.: 93-D-123
	Various Locations	2b. Construction Funded

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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8. Project Description, Justification, and Scope (continued)

Existing space at TA-16 will be utilized to receive the transfer of the technology from Mound.

Subproject 23: ICF Target Loading: TEC - \$1,200,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>s</u>					<u>Dates</u>
\$ 1,200	\$ 300	\$ 500	\$ 400	\$ 0	\$ 0	3rd Qtr. FY 1995 - 4th Qtr. FY 1997

LOS ALAMOS NATIONAL LABORATORY - PRODUCTS TRANSFERRED FROM PINELLAS PLANT: TEC - \$12,799,000

Subproject 24: Neutron Tube Target Loading: TEC - \$12,799,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>s</u>					<u>Dates</u>
\$ 12,799	\$ 7,952	\$ 2,847	\$ 2,000	\$ 0	\$ 0	2nd Qtr. FY 1994 - 1st Qtr. FY 1997

TEC increased from \$4,115,000 to \$12,799,000. Initial plans called for relocation and reestablishment of this activity at TA-21. Since that time, DOE has directed that all tritium related work be phased out of TA-21 due to operational and safety concerns. Subsequently, an interim plan, proposed consolidation of the NTTL activities in the Weapon Engineering Tritium Facility (WETF) at TA-16, which also supports tritium operations. This plan has now been fully documented and will require additional ES&H upgrades to existing TA-16 facilities. The TEC increase incorporates the change in location and required upgrades to assure appropriate ES&H safeguards.

Building 209 at TA-21 will be used as the location of the interim facility for the Neutron Tube Target Loading technology program at the LANL. Existing space at TA-16 will be utilized as the permanent location for the NTTL technology. The interim facility is required to move the technology prior to the cessation of donor site activities. The consolidation activities include Tritium Target Loading and Target Loading Verification. The loading of neutron tube targets will be accomplished by installing a glovebox line in Building 209. A small portion of an existing concrete frame structure will be modified to accept this glovebox line. The glovebox line will house a target loader, vacuum pump for the loader, and will have ancillary equipment consisting of a mass spectrometer, calorimeter, film dissolution station, thermal desorption with fume hood, and related piping, power, instrumentation, controls, etc.

LOS ALAMOS NATIONAL LABORATORY - PRODUCTS TRANSFERRED FROM ROCKY FLATS PLANT: TEC - \$14,270,000

Subproject 25: Pit Support Function: TEC - \$2,145,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>s</u>					<u>Dates</u>
\$ 2,145	\$ 2,145	\$ 0	\$ 0	\$ 0	\$ 0	2nd Qtr. FY 1996 - 3rd Qtr. FY 1997

TEC decreased from \$4,233,000 to \$2,145,000. TEC decrease due to a reassessment of donor and receiver site capital equipment transfer costs and requirements.

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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Building 66 at the TA-3/SIGMA site will be upgraded to accommodate the consolidation of the Pit Support technology maintenance program to be transferred from RF to LANL. Relocation of some equipment and pertinent records to continue to support the Pit Support mission is required.

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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8. Project Description, Justification, and Scope (continued)

Subproject 26: Beryllium Technology: TEC - \$12,125,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion Dates</u>
\$ 12,125	\$ 2,588	\$ 3,840	\$ 5,697	\$ 0	\$ 0	3rd Qtr. FY 1997 - 3rd Qtr. FY 1997

TEC increased from \$10,836,000 to \$12,125,000. TEC increase due to reassessment of cost estimate.

Building 141 at the TA-3 will be upgraded to accommodate the consolidation of the Beryllium Technology maintenance program to be transferred from RF to LANL. It is necessary to provide for continued vendor support and back-up capability to maintain small lot fabrication capability after the planned closure of RF. Relocation of some equipment and pertinent records to continue to support the Beryllium Technology mission is required.

SAVANNAH RIVER SITE - PRODUCTS TRANSFERRED FROM MOUND PLANT: TEC - \$36,950,000

Subproject 27: Gas Transfer Systems and Reservoir Surveillance Operations: TEC - \$36,950,000

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion Dates</u>
* \$ 34,950	* 15,260	* 13,300	* 6,390	* 0	* 0	1st Qtr. FY 1995 - 3rd Qtr. FY 1998

* TEC decreased from \$36,950,000 to \$34,950,000. The decrease is a result of no additional budget authority being requested because the current total appropriation is sufficient to complete the scope of the project.

At the Savannah River Site, this project provides funds for the location of new operations in an expansion area of Building 233-H and renovated areas of Building 232-H, Building 735-11A. A Reservoir Surveillance Operations (RSO) facility, to be located in 233-H, provides equipment to subject stockpile tritium reservoirs to a variety of environmental conditions such as thermal and mechanical shock, vibration, and centrifugal forces, and then function test them to verify adequate performance. This equipment will be located in isolated, sealed rooms tied into tritium stripper systems. A variety of other analytical capabilities are needed to perform gas analyses, calorimetry, leak and flow tests, and destructive examination to support both pre and post function activities. In addition, tritium loading for commercial sales and inertial confinement fusion microspheres will be performed in Building 233-H. New verification and service systems for Buildings 232-H and 233-H will be sized for economical expansion.

Facility space will be provided in vacant factory areas to allow initiation of development work and staging of equipment prior to the preparation of final facility space. This is required to move the technology prior to the cessation of donor site activities and required production schedules.

One area will be renovated to accommodate additional shelf storage and environmental chambers to conduct storage studies needed for support of Acorn Reservoir Programs. A second area in 232-H to be renovated will house equipment for hydrostatic burst testing. Space within an existing building will be used for a helium purification system.

In a third building, 735-11A, one area will be renovated to establish process development capabilities for support of Acorn reservoir prototype fabrication.

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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1.	Title and Location of Project:	Nonnuclear Reconfiguration,
Complex-21,	2a.	Project No.: 93-D-123
	Various Locations	2b. Construction Funded

9. Details of Cost Estimate by Site

(estimate is based on complete Conceptual Design Reports)

	SNL Four (4) <u>Subprojects</u>	LANL Five (5) <u>Subprojects</u>	KCP Fifteen (15) <u>Subprojects</u>	SR Two (2) <u>Subprojects</u>	LLNL One (1) <u>Subproject</u>
a. Engineering, design, and inspection and their percentage of construction costs, item b . . .	\$ 2,796 (9%)	\$ 3,575 (15%)		\$ 1,637 (5%)	
\$ 5,841 (32%)	\$ 10 (8%)				
b. Construction costs (incl. spec. egmt., e.g., gloveboxes)	29,627	23,725	32,279	18,483	120
c. Standard equipment	5,650	0	0	0	0
d. Other (incl. Prog & Const Mgmt)	4,798	1,230	1,721	4,129	10
Subtotal	\$42,871	\$28,530	\$35,637	\$28,453	\$ 140
e. Contingency percent of [a+b+c+d] cost	11,248 (25%)	3,059 (11%)		5,415 (15%)	
6,497 (23%)	10 (7%)				
Total estimated construction cost (TEC) .	<u>\$54,119</u>	<u>\$31,589</u>	<u>\$41,052</u>	<u>\$34,950</u>	<u>\$ 150</u>

Actual and planned allocation by location for fiscal year funds:

	Previous				Cumulative	
Cumulative	Years	FY 1996	FY 1997	FY 1998	All FYs	to
<u>Complete</u>						
Lawrence Livermore National Laboratory	\$ 150	\$ 0	\$ 0	\$ 0	\$ 150	\$ 0
Sandia National Laboratory, Albuquerque	40,094	14,025	0	0	54,119	0
Los Alamos National Laboratory	15,974	7,518	8,097	0	31,589	0
Kansas City Plant	37,522	3,530	0	0	41,052	0
Savannah River Site	15,260	13,300	6,390	0	34,950	0
Total Allocation by fiscal year	<u>\$109,000</u>	<u>\$38,373</u>	<u>\$14,487</u>	<u>\$ 0</u>	<u>\$ 161,860</u>	<u>\$ 0</u>

10 Method of Performance

Design and inspection will be performed under negotiated architect-engineer contracts or by operational contractor. Construction will be by fixed price contracts awarded after competitive proposals and administered by the DOE and Contractor staff. However, operating contractor personnel may perform design and construction roles for activities determined to be cost effective. Procurement of standard equipment will be administered by the DOE and Contractor staff on the basis of competitive proposals.

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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11. Schedule of Project Funding and Other Related Funding Requirements

			Previous Years		FY 1996		FY 1997		FY 1998
		Outyears		Total					
a.	Total Project Costs								
1.	Total Facility Costs								
	(a)		Line Item		\$ 52,079	48,648\$	58,627		\$ 2,506
\$	0		\$ 161,860						
	(b)		Plant Engineering & Design			0	0		0
0 0	0								
	(c)		Operating Expenses Funded Equipment				0		0
0 0	0								
	(d)		Inventories		0	0	0		0
	0								
	(e)		Total Facility Cost (Federal and Non-Federal)						
\$	52,079		\$ 485,462	\$ 2,506\$	0 \$ 161,860				
2.	Other Project Costs								
	(a)		R&D Necessary to Complete Project				0		0
0 0 0	0								
	(b)		Conceptual Design Costs			2,800	0		0
0 0	2,800								
	(c)		Decontamination & Decommissioning (D&D)						0
0 0 0	0		0						
	(d)		NEPA Documentation Costs			0	0		0
0	0		0						
	(e)		Other Project-Related Costs			20,284	6,904		3,404
	811		0	31,403					
	Total Other Project Costs			\$ 23,084	6,904\$	3,404\$	811 \$	0	\$ 34,203
	Total Project Costs			\$ 75,163	55,552\$	62,031\$	3,317 \$	0	\$ 196,063
	(f)		LESS: Non-Federal Contribution				0		0
\$	0		\$ 0	\$ 0					
	Net Federal Total Project Costs (TPC)			\$ 75,163	\$ 55,552\$	62,031\$	3,317 \$	0	\$ 196,063
b.	Related Annual Costs (estimated life of the project--30 years)								
1.	Facility Operating Costs c/								
2.	Facility Maintenance and Repair Costs c/								
3.	Programmatic Operating Expenses Directly Related to the Facility c/								
4.	Capital Equipment not Related to Construction but Related to the Programmatic Efforts in the Facility \$								
5.	GPP or Other Construction Related to Programmatic Effort in the Facility \$								

c/ Activities will reside within the footprint of existing facilities; co-location with ongoing activities is a principal cost reduction objective of this program; the modernization study and other congressional studies document the expected facility operation and maintenance costs - post NNR.

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
6.	Utility Costs	\$ 0
7.	Other Costs	\$ 0
	Total Related Annual Funding	<u>\$ 0</u>

1.	Title and Location of Project:	Nonnuclear Reconfiguration,
Complex-21,	2a.	Project No.: 93-D-123
	Various Locations	2b. Construction Funded

12. Narrative Explanation of Total Subproject 93-1 Funding and Related Funding Requirements

a.	Total Project Funding	
1.	Total Facility Costs	
(a)		Line Item
		-
		\$163,860,000
(b)		PE&D -
None		
(c)		Operating Expense Funded Equipment - None
(d)		
Inventories - None		
2.	Total Other Project Costs	
(a)		Research
and Development Necessary to Complete Project - None.		
(b)		Conceptual Design Costs - Estimated to be \$2,800,000 (Refined Estimate)
(c)		.
Decontamination and Decommissioning (D&D) - None		
(d)		NEPA Documentation - Costs were not borne by this project. Other Project Related Costs - include Pre-Title
(e)		

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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(f) Non-
 Federal Contribution - None

1. Complex-21,	Title and Location of Project: 2a. Various Locations	Nonnuclear Reconfiguration, Project No.: 93-D-123 2b. Construction Funded
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b. Related Annual Costs

1. Facility operating costs c/
2. Facility maintenance and repair costs - c/
3. Programmatic operating expenses directly related to the facility - c/
4. Capital equipment not related to construction but related to the programmatic effort in the facility - None.
5. Utility costs - Negligible; co-resident operations.
6. Other costs - None

c/ Activities will reside within the footprint of existing facilities; co-location with ongoing activities is a principal cost reduction objective of this program; the modernization study and other congressional studies document the expected facility operation and maintenance costs - post NNR.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project:Life Safety Upgrades, Y-12 Plant, Oak Ridge, Tennessee	2a.Project No. 93-D-122 2b.Construction Funded
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SIGNIFICANT CHANGES

- None.

DEPARTMENT OF ENERGY
 FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
 (Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
 (Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project: Life Safety Upgrades, Y-12 Plant, Oak Ridge, Tennessee	2a Project No.: 93-D-122 2b. Construction Funded
3a. Date A-E Work Initiated (Title I Design Start Scheduled): 1st Qtr. FY 1993	5. Previous Cost Estimate: Total Estimated Cost (TEC) \$29,200 Total Project Cost (TPC) \$30,320
3b. A-E Work (Titles I & II) Duration: 36 months	
4a. Date Physical Construction Starts: 3rd Qtr. FY 1994	6. Current Cost Estimate: TEC -- \$29,200 TPC -- \$30,320
4b. Date Construction Ends: 4th Qtr. FY 1998	

7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1993	\$ 2,700	\$ 0	\$ 2,700	\$ 625
1994	5,000	0	5,000	1,683
1995	5,000	0	5,000	5,838
1996	7,200	0	7,200	6,808
1997	7,200	0	7,200	7,546
1998	2,100	0	2,100	6,700

8. Project Description, Justification and Scope

The purpose of this project is to begin to bring the Y-12 Plant into compliance with NFPA codes, as required by OSHA and by DOE orders such as 5480.7. The project is part of a program to bring the plant into compliance. The items to be corrected by this project have been identified by internal audits, technical safety appraisals, and tiger team audits. Additional items identified but not included in this project will be prioritized, estimated, and (1) included in a future project or (2) added to this project in a future year if adequate funds are available.

This project will provide upgrading and modernization of fire protection systems, electrical equipment, mechanical systems, and emergency electrical generators which provide power for critical life safety systems. This project is part of a program which is intended to upgrade the Y-12 Plant's compliance with National Fire Protection Association (NFPA) codes relating to life safety. The extent of this project will address in excess of 200 buildings at the Y-12 plant.

The project will provide improvements to life safety in a number of areas, such as fire protection sprinklers, fire doors and walls, smoke detectors, fire alarms, emergency electrical generators, and mechanical systems. The fire protection sprinkler improvements will involve the addition of sprinklers to areas which are not covered or modifications to existing sprinkler systems to correct conditions which are in conflict with national codes. The project will install fire doors and install or upgrade fire walls to provide adequate fire separation of

1. Title and Location of Project:Life Safety Upgrades, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a.Project No.: 93-D-122 2b.Construction Funded
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8. Project Description, Justification and Scope (Continued)

emergency egress paths. Smoke detection systems will be provided for life safety exits. The existing fire alarm systems will be upgraded or replaced to comply fully with current codes. Approximately 16 existing emergency generators and their controls, which supply power to life safety systems such as evacuation alarms, criticality alarms, and fire alarms, will be replaced with modern equipment.

* FY 1998 funding is for construction and construction management.

9. Detail of Cost Estimate

<u>Cost</u>	<u>Item Cost</u>	<u>Total</u>
a. Design and Management Costs		\$ 6,850
(1) Engineering, design and inspection at approximately 25 percent of construction costs, Item c \$	4,050	
(2) Construction management costs	1,300	
(3) Project management at approximately 9 percent of construction costs (Item c)	1,500	
b. Land and Land Rights		0
c. Construction Costs		16,400
1. Improvement to land	0	
2. Building	13,650	
3. Special equipment	1,300	
4. Utilities	1,450	
5. Demolition	0	
d. Standard equipment		0
e. Major computer Items		0
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout and acceptance		100
Subtotal (a through g)		\$ 23,350
h. Contingencies at approximately 25 percent of above costs		5,850
i. Total line item cost (Section 11.a.1.(a))		\$ 29,200
j. LESS: Non-Federal contribution		0
k. Net Federal total estimated cost (TEC)		<u>\$ 29,200</u>

10. Method of Performance

Facility Manager will provide engineering and procurement services for the new fire alarm and detection system. Engineering on the remaining subprojects will be performed under a negotiated fixed-price architect-engineer contract. To the extent feasible construction and procurement will be accomplished with a construction manager using fixed-price subcontractors.

1. Title and Location of Project: Life Safety Upgrades, Y-12 Plant, Oak Ridge, Tennessee (Continued)	2a. Project No.: 93-D-122 2b. Construction Funded
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11. Schedule of Project Funding and Other Related Funding Requirements

	Prior Years FY 1998	FY 1995 Total	FY 1996	FY 1997
a. Total Project Funding				
1. Total facility costs				
(a) Line Item (Section 9.j.)	\$ 2,308	\$ 5,838	\$ 6,808	\$ 7,546
(b) Plant, Engineering and Design (PE&D)	0	0	0	0
(c) Operating expense funded equipment	0	0	0	0
(d) Inventories	0	0	0	0
(e) Total facility costs (Federal and Non-Federal)	\$ 2,308	\$ 5,838	\$ 6,808	\$ 7,546
2. Other project costs				
(a) R&D necessary to complete project	0	0	0	0
(b) Conceptual design cost	230	0	0	0
(c) Decontamination & Decommissioning (D&D)	0	0	0	0
(d) Site characterization	100	0	0	0
(e) NEPA documentation costs	20	0	0	0
(f) Other project related costs	550	50	50	60
(g) Total other project costs	\$ 900	\$ 50	\$ 50	\$ 60
(h) Total project costs	\$ 3,208	\$ 5,888	\$ 6,858	\$ 7,606
(i) LESS: Non-Federal contribution	0	0	0	0
(k) Net Federal total project cost (TPC)	\$ 3,208	\$ 5,888	\$ 6,858	\$ 7,606
b. Related annual costs				
1. Facility operating costs				\$ 0
2. Facility maintenance and repair costs				0
3. Programmatic operating expenses directly related to the facility				0
4. Capital equipment not related to construction but related to the programmatic effort in the facility				0
5. GPP or other construction related to programmatic effort in the facility				0
6. Utility costs				0
7. Other costs				0
Total related annual costs				\$ 0

1. Title and Location of Project: Life Safety Upgrades, Y-12 Plant,
Oak Ridge, Tennessee (Continued)

2a. Project No.: 93-D-122
2b. Construction Funded

12. Narrative Explanation of Total Project Funding and Related Funding Requirements

a. Total project funding

1. Total facility costs

(a)

Line item -- Construction line item costs for the engineering design, procurement, demolition, and construction are estimated to be \$29,200,000.

(b)

PE&D -- None.

(c)

Operating expense funded equipment -- None.

(d)

Inventories -- None.

2. Other project costs

(a)

R&D necessary to complete construction -- None.

(b)

Conceptual design -- Approximately \$230,000 were incurred to develop the scope of the project.

(c)

Decontamination & Decommissioning (D&D) -- None.

(d)

Site characterization -- Approximately \$100,000 will be incurred to perform site characterization activities

(e)

NEPA documentation -- Approximately \$20,000 was incurred for NEPA documentation development.

(f)

Other project related funding -- Engineering and operational support activities for Y-12 Plant functions before and during design and construction is estimated to cost approximately \$770,000.

b. Related annual costs -- None.

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(Changes from FY 1994 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project: Replace Emergency Notification Systems, Various Locations	2a. Project No.: 92-D-126 2b. Construction Funded
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SIGNIFICANT CHANGES

- TEC increased from \$25,600,000 to \$28,800,000. TPC increased from \$26,500,000 to \$29,700,000 due to increased requirements at the Oak Ridge Y-12 Plant.
- Date construction ends changed from 4th Qtr. FY 1995 to 4th Qtr. FY 1998 due to delay and additional requirements at the Y-12 plant.
- Scope changed:

Additional requirements:

The increase is due to delays and cost growth at the Oak Ridge Y-12 plant. The \$ 3,200,000 TEC increase is to cover increased rigor and refinements associated with facility Conduct of Operations requirements for construction activities, additional safety requirements in areas such as hoisting/rigging, a shortage of Q-cleared construction personnel resulting in escort requirements, implementation of new waste certification procedures, and increased radiological control requirements. The construction activities for three major buildings are being deferred until funds are available in FY 1998 and one building is being deleted from the project due to Y-12 plant mission changes.

The cost, schedule and scope has changed per approved BCP AL96025.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1994 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project: Systems,	2a. Various Locations	Replace Emergency Notification Project No.: 92-D-126 2b.
Construction Funded		

3a. Date A-E work Initiated (Title I Design Start Scheduled): 3rd Qtr. FY 1992 \$25,600	5. Previous Cost Estimate: Total Estimated Cost (TEC) --
3b. A-E work (Titles I & II) duration: 24 months \$26,500	Total Project Cost (TPC) --

4a. Date Physical Construction Starts: 2nd Qtr. FY 1993	6. Current Cost Estimate: TEC -- \$28,800
4b. Date Construction Ends: 4th Qtr. FY 1998 <u>1</u> /	TPC -- \$29,700

7. Financial Schedule (Federal Funds):

Fiscal Year	Appropriations	Adjustments	Obligations	Costs
1992	\$ 4,200	\$ 0	\$ 4,200	\$ 43
1993	10,900	0	10,900	2,074
1994	2,000	8,500 <u>2</u> /	10,500	2,769
1995	0	0	0	6,503
1996	0	0	0	8,479
1997	0	0	0	5,732
1998	3,200	0	3,200	3,200

8. Project Description, Justification and Scope

* The completion date has been changed from 4th Qtr. FY 1995 to 4th Qtr. FY 1998, TEC has been changed from \$25,600,000 to
 * \$28,800,000 and TPC has been changed from \$26,500,000 to \$29,700,000. The increase is due to delays and cost growth at
 * the Oak Ridge Y-12 plant. The \$ 3,200,000 TEC increase is to cover increased rigor and refinements associated with
 * facility Conduct of Operations requirements for construction activities, additional safety requirements in areas such as
 * hoisting/rigging, a shortage of Q-cleared construction personnel resulting in escort requirements, implementation of new
 * waste certification procedures, and increased radiological control requirements. The construction activities for three
 * major buildings are being deferred until funds are available in FY 1998 and one building is being deleted from the project

1/ Construction completion will slip to 4th Qtr. FY 1998 because the increase is due to delays and cost growth at the Oak Ridge Y-12 Plant.

2/ \$8,500,000 in prior year unobligated funds from GPD-121 were used to offset the requirement for new budget authority in FY 1994.

* due to Y-12 plant mission changes.

This project replaces the existing public address (PA) systems at the Kansas City Plant and Oak Ridge Y-12 Plant with an Emergency Notification System (ENS). These new systems will be installed to comply with National Fire Protection Association (NFPA) standards, Occupational Safety and Health Act (OSHA), and various Department of Energy (DOE) Orders.

*

1. Title and Location of Project: Replace Emergency Notification Systems, Various Locations (Continued)	2a. Project No. 92-D-126 2b. Construction Funded
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8. Project Description, Justification and Scope (Continued)

a. Subproject 01 - Kansas City

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
	<u>Outyear</u>	<u>Construction</u>	<u>Start - Completion</u>	<u>Dates</u>		
* 1997 <u>3/</u>	\$6,800	\$6,800	\$0	\$0	\$0	\$0 4th Qtr. FY 1994 - 1st Qtr. FY

This line item replaces the existing commercial grade public address (PA) system at the Kansas City Plant with an electronically supervised plant-wide emergency notification system and a nonemergency public address PA system. Two separate notification systems will be installed.

The new emergency notification system will be UL listed for fire protection signaling service. Installation of the new emergency notification system will be in accordance with NFPA 72A, "Installation, Maintenance, and Use of Local Protective Signaling Systems for Guard's Tour, Fire Alarm and Supervisory Service"; NFPA 72F, "Installation, Maintenance, and Use of Emergency Voice/Alarm Communication Systems"; NFPA 72G, "Notification Appliances for Protective Signaling Systems"; and NFPA 101, "Code for Safety to Life from Fire in Building and Structures." The system will comply with DOE Orders 5480.1B, 5480.4, and 5480.7; and OSHA, 29 CFR 1910, which specify requirements applicable to exits and fire protection features.

The scope of this project requires the removal of all of the existing public address system components (except speakers) including the control units, amplifiers, junction boxes, and wiring. Demolition of the abandoned components and installation of the nonemergency system will be accomplished after the new emergency system has been tested and is operational.

The intent of this project is to provide the Kansas City Plant with an emergency notification system meeting DOE, NFPA, and OSHA requirements and with a separate nonemergency notification system. The existing Kansas City Plant notification system is an industrial grade, general purpose public address system; the system is used for emergency notifications involving fire, security, and weather; and also for nonemergency announcements, lunch and shift-change signals, and news items. The existing public address system is inadequate and does not meet DOE, NFPA, or OSHA requirements. The major areas of deficiency are:

- a. The current system is not electrically supervised as required by NFPA 72A.
- b. The current public address system does not provide an audible alarm above the ambient sound level in high-noise areas within the Kansas City Plant.
- c. The current system is an industrial grade, general purpose, public address system. The system is not dedicated to emergency notifications involving fire, security, or weather but is also used for general announcements, lunch and shift-change signals, and news items.
- d. The current public address system does not provide automatic occupant notification and evacuation in high-hazard industrial areas as required by the Life Safety Code, NFPA 101.
- e. The current public address system does not meet NFPA requirements for survivability during a fire.
- f. The current system is not Underwriters Laboratory listed for emergency notification use and cannot be Underwriters Laboratory listed because of fundamental design deficiencies.

3/ The subproject has a variance of 1st Qtr. because of lack of "Q" cleared escort for workers.

1. Title and Location of Project: Replace Emergency Notification Systems,
Various Locations (Continued)

2a. Project No. 92-D-126
2b. Construction Funded

To accomplish the overall fire protection objective of the DOE of having no threats to the public health and welfare and no undue hazards to life from fire, DOE Order 5480.7 requires that "Department of Energy buildings comply with the intent of the Life Safety Code (NFPA 101) and with specific requirements of 29 CFR Part 1910 (OSHA) applicable to exits and fire protection features." Furthermore, the Life Safety Code, NFPA 101, requires a fire alarm system to be provided for assembly, business, and industrial occupancies (8-3.4.1, 9-3.4.1, 26-3.4.1, 27-3.4.1, and 28-3.4.1).

1. Title and Location of Project: Replace Emergency Notification Systems, Various Locations (Continued)	2a. Project No. 92-D-126 2b. Construction Funded
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8. Project Description, Justification and Scope (Continued)

OSHA, 29 CFR Part 1910, requires, as part of the employee emergency plan, that the employer shall establish an employee alarm system to provide warning for emergency action and for reaction time for safe escape, and that the system shall be capable of being heard above the ambient noise level, and be distinctive and recognizable as a signal to evacuate.

Any fire alarm system is composed of three components - fire detection, alarm, and communication. The fire detection component is in place. A new fire alarm system, the alarm component, has been installed and is now operational. This line item project will complete the third component of the overall fire alarm system communication.

Subproject 02 - Mound

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
<u>Outyear</u>	<u>Construction Start - Completion Dates</u>				
\$0	\$0	\$0	\$0	\$0	Project Canceled

Delayed readiness to proceed as well as subsequent plant mission uncertainties have resulted in separate consideration of this subproject as an independent line item.

Subproject 03 e. Pinellas

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
<u>Outyear</u>	<u>Construction Start - Completion Dates</u>				
\$0	\$0	\$0	\$0	\$0	Project Canceled

Delayed readiness to proceed as well as subsequent plant mission uncertainties have resulted in separate consideration of this subproject as an independent line item.

Subproject 04 -dOak Ridge

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>
<u>Outyear</u>	<u>Construction Start - Completion Dates</u>				
* \$22,000	\$18,800	\$0	\$0	\$0	3rd Qtr. FY 1994 - 4th Qtr. FY 1998 4/

This project will replace the emergency notification system for portions of the protected, limited, and eastern areas of the Y-12 Plant. The proposed emergency notification system is intended to ensure a reliable, available emergency warning system to the eastern end of the plant and remaining areas in the protected area. It is also intended to provide comprehensive monitoring and testing capabilities of the system from the plant shift superintendent's office.

The proposed emergency notification system will be hardwired and shall provide a warning system used for radiation alarms and plant shift superintendent emergency announcements. The emergency notification system will replace the existing public address system in these areas to provide primary emergency signal and necessary announcements to plant personnel. New hardwired connections will be used by the emergency

* 4/ Construction completion will slip to 4th Qtr. FY 1998 because the increase is due to delays and cost growth at the Oak Ridge Y-12 Plant.

1. Title and Location of Project: Replace Emergency Notification Systems, Various Locations (Continued)	2a. Project No. 92-D-126 2b. Construction Funded
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notification system to access a new dedicated speaker system. The emergency notification system will also utilize an existing supervisory

1. Title and Location of Project: Replace Emergency Notification Systems, Various Locations (Continued)	2a. Project No. 92-D-126 2b. Construction Funded
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8. Project Description, Justification and Scope (Continued)

control and data acquisition system for continuous monitoring of the system via hardwired connections (installed as part of USR III, ENS). The existing radiation detectors will be utilized to provide the evacuation signal to the emergency notification system.

The present system, a hardwired configuration, has been minimally upgraded through the years including a recent utilities restoration upgrade limited to material access areas. The remainder of the system is functionally inadequate to meet emergency notification requirements. One of the major problems with the existing system is the lack of status monitoring capability to allow the quick detection of system problems. This increases the downtime of the system. The proposed system will correct these problems and increase the reliability and maintainability of the system. The existing system, proposed for replacement, has little flexibility to adapt to changing needs and, with its lack of monitoring capability and redundancy, will always be susceptible to unacceptable outages. This requires excessive maintenance effort to monitor and troubleshoot the system to insure emergency notification coverage. In addition, the present system configuration only permits limited preventative maintenance on a "live" system.

9. Details of Cost Estimate

	<u>Item Cost</u>	<u>Total Cost</u>
a. Design and Management Costs		\$ 2,750
(1) Engineering design and inspection at approximately 13 percent of construction costs		
(a) Kansas City		\$ 530
(b) Oak Ridge		2,220
(2) Construction management costs		0
(3) Project management		0
b. Land and land rights		0
c. Construction costs (systems).		21,890
(a) Kansas City		5,120
(b) Oak Ridge		16,770
1. Improvements to land		0
2. Buildings		0
3. Special equipment		0
4. Utilities		0
5. Demolition		0
d. Standard equipment		0
e. Major computer items		0
f. Removal cost less salvage		0
g. Design and project liaison, testing, checkout and acceptance		0
h. Subtotal (a through g)		\$ 24,640
i. Contingencies at approximately 17 percent of above costs		<u>4,160</u>

1. Title and Location of Project: Replace Emergency Notification Systems, Various Locations (Continued)	2a. Project No. 92-D-126 2b. Construction Funded
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j. Total line item cost (Section 11.a.1.(a))
\$ 28,800
k. LESS: Non-Federal contribution
0
l. Net Federal total estimated cost (TEC)
\$ 28,800

10. Method of Performance

Design and inspection will be performed under a negotiated fixed-price architect-engineer contract. Construction will be performed under a fixed-price contract awarded on the basis of competition.

1. Title and Location of Project: Replace Emergency Notification Systems, Various Locations (Continued)	2a. Project No. 92-D-126 2b. Construction Funded
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11. Schedule of Project Funding and Other Related Funding Requirements

		Prior Years	FY 1995	FY 1996	FY 1997	FY 1998
<u>Total</u>						
a. Total project costs						
1. Total facility costs						
(a) Line item (Section 9.j.)			\$ 4,886	\$ 6,503		\$ 8,479
\$ 5,732	\$ 3,200	\$28,800				
(b) Plant, Engineering and Design (PE&D)			0	0	0	
0 0 0						
(c) Operating expense funded equipment.			0	0	0	
0 0 0						
(d) Inventories			0	0		0
0 0 0						
(e) Total facility cost (Federal and Non-Federal)			\$ 4,886	\$ 6,503		\$ 8,479
\$ 5,732	\$ 3,200	\$28,800				
2. Other project costs						
(a) R&D necessary to complete project			\$ 0	\$ 0		\$ 0
\$ 0	\$ 0	\$ 0				
(b) Conceptual design costs			600	0		0
0 0 600						
(c) Decontamination and decommissioning (D&D)	0	0	0	0	0	0
0 0 0						
(d) NEPA documentation costs.	300	0	0	0	300	
0 0 0						
(e) Other project related costs			0	0		0
0 0 0						
(f) Total other project costs			\$ 900	\$ 0		\$ 0
\$ 0	\$ 0	\$ 900				
(g) Total project costs			\$ 5,786	\$ 6,503		\$ 8,479
\$ 5,732	\$ 3,200	\$29,700				
(h) LESS: Non-Federal contribution			0	0		0
0 0 0						
(i) Net Federal total project cost (TPC)			\$ 5,786	\$ 6,503		\$ 8,479
\$ 5,732	\$ 3,200	\$29,700				
b. Related annual costs (estimated life of project--20 years)						
1. Facility operating costs	\$ 140					
2. Facility maintenance and repair costs	0					
3. Programmatic operating expenses directly related to the facility	0					
4. Capital equipment not related to construction but related to the programmatic effort in the facility	0					
5. GPP or other construction related to the programmatic effort in the facility	0					

1. Title and Location of Project: Replace Emergency Notification Systems, Various Locations (Continued)		2a. Project No. 92-D-126
		2b. Construction Funded
6. Utility costs		
. . . 0		
7. Other costs		
. . . 0		
Total related annual costs		
. . . \$ <u>140</u>		

1. Title and Location of Project: Replace Emergency Notification Systems, Various Locations (Continued)	2a. Project No. 92-D-126 2b. Construction Funded
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12. Narrative Explanation of Total Funding and Other Related Funding Requirements

a. Total project costs

1. Total facility costs

- (a) Line item -- Construction line item costs for the engineering design, procurement, demolition, and construction at Kansas City and Oak Ridge are estimated to be \$28,800,000.
- (b) PE&D -- None.
- (c) Operating expense funded equipment -- None.
- (d) Inventories -- None.

2. Other project costs

- (a) R&D necessary to complete construction -- None.
- (b) Conceptual design -- Approximately \$600,000 have been expended to finalize the scope of the project.
- (c) Decontamination and Decommissioning (D&D) -- None.
- (d) NEPA documentation -- Approximately \$300,000 have been expended for this project.
- (e) Other project related funding -- None.

b. Related annual costs

- 1. Facility operating costs -- Approximately \$140,000 will be expended on operating costs annually.
- 2. Facility maintenance and repair costs -- None.
- 3. Programmatic operating expenses directly related to the facility -- None.
- 4. Capital equipment not related to construction but related to the programmatic effort of the facility -- None.
- 5. GPP or other construction related to the programmatic effort -- None.
- 6. Utility costs -- None.
- 7. Other Costs -- None.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project: Facilities Capability Assurance Program	2a. Project No.: 88-D-122
(FCAP), Various Locations	2b. Construction Funded

SIGNIFICANT CHANGES

- The total estimated cost (TEC) for this project decreased from \$405,174,000 to \$398,724,000 and the total project cost (TPC) decreased from \$452,074,000 to \$445,624,000 due to Baseline Change Proposals (BCP).
- The TEC of subproject 92-31, Replace/Refurbish Deteriorated Elevators, Y-12, was reduced from \$10,920,000 to \$9,420,000 as a result of approved BCP, AL96030, that downsized the project consistent with the Stockpile Stewardship Management Programmatic Environmental Impact Statement.
- The TEC of subproject 93-35, Upgrade Materials Engineering Laboratory, KC, was reduced from \$13,200,000 to \$11,700,000 as a result of approved BCP, AL96019, that revised the project site location and adjusted the scope in compliance with current DOE complex mission directions.
- The TEC of subproject 94-37, Chilled Water System Replacement, KC, was reduced from \$11,600,000 to \$6,200,000 as a result of approved BCP, AL96022, that adjusted the scope in compliance with Departmental decisions related to production facility downsizing consistent with the Stockpile Stewardship and Management Programmatic Environmental Impact Statement.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
(Changes from FY 1997 Congressional Budget Request are denoted with a vertical line in left margin.)

DEFENSE ASSET ACQUISITION
(Tabular dollars in thousands. Narrative material in whole dollars.)

Defense Programs Stockpile Management

1. Title and Location of Project:		Facilities Capability Assurance
Program		2a.
Project No. 88-D-122	(FCAP), Various Locations	2b.
Construction Funded		

3a.	Date A-E Work Initiated, (Title I Design Start Scheduled):	2nd Qtr. FY 1988
5.	Previous Cost Estimate:	
		Total Estimated Cost (TEC) --
\$405,174		
3b.	A-E Work (Titles I & II) Duration:	Ongoing
\$452,074		Total Project Cost (TPC) --

4a.	Date Physical Construction Starts:	2nd Qtr. FY 1988
4b.	Date Construction Ends:	3rd Qtr. FY 2000
		6. Current Cost Estimate:
		TEC -- \$398,724
		TPC -- \$445,624

7. Financial Schedule (Federal Funds):

<u>Fiscal Year</u>	<u>Appropriations</u>	<u>Adjustments</u>	<u>Obligations</u>	<u>Costs</u>
1988	\$ 15,400	\$ 0	\$ 15,400	\$ 3,399
1989	79,341	0	77,492	18,512
1990	83,099	11,119 <u>1/</u>	94,821	46,774
1991	106,806	0	107,158	59,490
1992	47,473	0	9,829	38,569
1993	87,100	-63,967 <u>2/</u>	13,934	32,738
1994	27,100 <u>3/</u>	-47,618 <u>4/</u>	25,161	40,946
1995	14,820	-6,000 <u>4/</u>	8,226	33,733

1/ Reflects the sequestration of funds for FY 1990 (-\$1,246,000) and the FY 1990 omnibus reprogramming approved by appropriations subcommittee (\$12,365,000).

2/ FY 1992 reprogramming, approved in FY 1993, provided funding \$5,000,000 for subproject 92-32. \$68,967,000 was withdrawn from FCAP for the FY 1994 budget reduction and reprogrammed to Reconfiguration. This resulted in a net adjustment of \$63,967,000.

3/ The FY 1994 appropriation request has been reduced from \$27,100,000 to \$21,100,000 reflecting the expected reapplication of prior year funds (\$6,000,000) from GPD-121. \$23,903,000 of prior year appropriation credit transferred to EM in FY 1994 with the four Rocky Flats subprojects. Also cancellation of 90-17 and 91-23 for FY 1995 Amendment of \$24,118,000, reduction of 89-12 of \$244,000 and 91-27 of \$653,000, and addition to 91-30 of \$1,300,000.

4/ Cancellation of subprojects 91-23, \$1,100,000 and 92-32, \$4,900,000 provided funding for the FY 1996 Amendment for project 92-D-126, Tritium Loading Modifications, SR.

1. Title and Location of Project: Program			Facilities Capability Assurance		
2a. Project No. 88-D-122 (FCAP), Various Locations (Continued)			2b.		
Construction Funded					
1996	8,660	-6,069 <u>5/</u>	-1,154		28,459
1997	21,940	0	21,940		45,080
1998	19,520	0	25,317 <u>6/</u>		30,271
1999	0	0	600		20,753

5/ Cancellation of subproject 90-17, \$2,699,100; downscoped subproject 94-37, \$1,000,000; provided funding for FY 1996 offset.

6/ Includes \$18,920,000 in new obligational authority and \$6,397,000 in use of prior year obligational authority.

1. Title and Location of Project: Program	2a. Project No. 88-D-122 (FCAP), Various Locations (Continued)	Facilities Capability Assurance
Construction Funded		2b.

8. Project Description, Justification and Scope

The downscoping, cancellation and the disposition of funds withdrawn from several subprojects is detailed in the narrative of each subproject within this data sheet. In accordance with the FCAP plan/charter part of the uncommitted funds from completed and canceled projects have been reconciled and applied to other ongoing FCAP subprojects to reduce out-year mortgages. These actions have been accomplished utilizing the Baseline Change Proposal (BCP) process.

The Facilities Capability Assurance Program (FCAP) is a continuing initiative of the Nuclear Weapons Stockpile Management Complex (NWSMC) intended to actively address and manage the continuing deterioration of the Complex's aging infrastructure. The Complex has in excess of 14.5 million square feet in buildings, of which 8.97 million square feet were built in the 1940s and 1950s (56.1 percent). The primary utility systems were designed and built during these same time frames. The estimated value of these facilities (buildings and utilities) in FY 1988 dollars exceeds \$8.2 billion (based on parametric evaluation escalated to FY 1988 dollars which is significantly less than actual replacement costs). An overall "investment strategy" has been developed through this line item to assure that current and future requirements and capabilities of the Department of Energy to meet national security missions does not erode as the Complexes infrastructure continues to age and deteriorate from use. FCAP utilizes an objective process to identify each project for inclusion into the line item and prioritizes each project to optimize the allocation of limited capital resources. Each project is further reviewed, approved, and prioritized by the Capital Assets Management Program (CAMP).

The infrastructure deterioration problem was first addressed in the Restoration Program for production equipment, facilities, and utilities. FCAP has been developed as a follow-on program after Restoration by addressing long term solutions for: (a) correcting aging and failed utility systems; (b) correcting energy inefficiencies; (c) reduce high maintenance facilities costs; (d) improving and correcting safety and health conditions in work places; and (e) adjustment of facilities to meet current and future mission needs within the DOE complex.

FCAP was designed to maintain, repair, or replace aging and deteriorated facilities within the DOE Weapons Complex to meet current and future mission requirements with an ongoing program and maintain programmatic continuity. FCAP uses several lessons learned from Restoration as its basis, such as identifying problems through appraisals, then managing resources and priorities based on a projectable level of funding, and using those funds for a defined list of projects. These features have been adapted to the larger, more complex arena of facilities renovation, modernization, and replacement.

Key elements of FCAP as a program are as follows:

- Periodic appraisals are required for all facilities on each site. The appraisals identify deficiencies related to poor physical condition or to the facility's functional inadequacy to meet current program requirements. Deficiencies found are segregated into categories depending on the size of the problem, the most appropriate funding source, and their relative priorities. Subprojects are then scoped for budget consideration.
- Subprojects proposed for FCAP must meet certain guidelines before being included in the FCAP line item. They are included only if (a) they meet the FCAP poor-condition/functionally-inadequate criteria; (b) the Weapons Complex has a projected long term need for that facility in order to meet mission requirements; and (c) the justification is

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

primarily based on current known mission requirements (as opposed to new initiatives or capabilities that should stand on their own).

- Each subproject included in FCAP's line item will be managed separately within the bounds specified in the construction project data sheet. As such, the construction project data sheet will constitute FCAP's "control list" of subprojects and FCAP's funding request will include funds necessary for both prior year mortgages and budget year new start requirements.

1. Title and Location of Project: Program	2a. Project No. 88-D-122 (FCAP), Various Locations (Continued)	Facilities Capability Assurance 2b.
Construction Funded		

8. Project Description, Justification and Scope (Continued)

FCAP's purpose is to maintain the infrastructure within the weapons complex and meet current and projected mission needs in support of DOE objectives outlined by the President. FCAP does this by replacing obsolete and inadequate facilities as required to maintain programmatic continuity. All subprojects are justified and prioritized based on these long term programmatic impacts. Many secondary benefits are also gained from these replacements; especially, ES&H, Safeguards and Security, and DOE Order Compliance.

Attaining proper funding levels (originally targeted for \$150 million per year) is essential to FCAP's success. When FCAP is adequately funded, replacements will be done in programmatic priority order, with additional benefits going to the ES&H areas. If FCAP is not adequately funded, work-arounds will have to be found for the facilities impacted, postponing both the programmatic and the ES&H gains until the ES&H concerns become the prime driver and the project becomes an urgently needed ES&H line item. This defeats the purpose of FCAP and does not enhance the long range goals of DOE's overall program objectives.

The following is a brief description and justification for each of the subprojects proposed for FY 1996 FCAP funding. Each subproject has gone through a validation and mission justification process and is included here because it is needed in order to maintain the Complex's capability to meet its current mission. FY 1998 funding requirements are noted in each subprojects funding profile.

FY 1988 Projects

Subproject 88-01: Weapons Special Purpose Bay Replacement Complex, Pantex Plant, Amarillo, Texas

<u>Dates</u>	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>		<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	\$30,000	\$30,000	\$0	\$0	\$0	\$0		Subproject Completed

Subproject 88-02: Weapons Production Primary Standards Lab, Sandia National Laboratory, Albuquerque, New Mexico

<u>Dates</u>	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>		<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
Completed	\$17,700	\$17,700	\$0	\$0	\$0	\$0		Subproject

Subproject 88-03: Electrical Distribution System Replacement and Upgrade, Rocky Flats Plant, Golden Colorado

<u>Dates</u>	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>		<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	\$0	\$0	\$0	\$0	\$0	\$0		Transferred to EM

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

Subproject 88-04: Replace Wooden Buildings, Y-12 Plant, Oak Ridge, Tennessee

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
\$10,750	\$10,750	\$0	\$0	\$0	\$0	Subproject Completed

Final closeout procedures have been initiated.

1. Title and Location of Project:	Facilities Capability Assurance
Program	
2a. Project No. 88-D-122	
(FCAP), Various Locations (Continued)	2b.
Construction Funded	

8. Project Description, Justification and Scope (Continued)

Subproject 88-05: Renovate Power Supply Distribution System, Y-12 Plant, Oak Ridge, Tennessee

<u>Dates</u>	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	\$7,458	\$7,458	\$0	\$0	\$0	\$0	Subproject Completed

Subproject 88-06: Restore Condensed Water System, Kansas City Plant, Kansas City, Missouri

<u>Dates</u>	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	\$1,722	\$1,722	\$0	\$0	\$0	\$0	Subproject Completed

Subproject 88-07: Roof Replacements, Rocky Flats Plant, Golden, Colorado

<u>Dates</u>	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	\$5,840	\$5,840	\$0	\$0	\$0		Subproject Completed

Subproject 88-08: Replace HVAC and Process Cooling System, Mound Plant, Miamisburg, Ohio

<u>Dates</u>	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	\$7,083	\$7,083	\$0	\$0	\$0	\$0	Subproject Completed

Subproject 88-09: HVAC Replacements, Pinellas Plant, Clearwater, Florida

<u>Dates</u>	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	\$2,930	\$2,930	\$0	\$0	\$0	\$0	Subproject Completed

Subproject 88-10: Replace Air Handling Unit and HVAC, Kansas City Plant, Kansas City, Missouri

Dates	TEC	Previous	FY 1996	FY 1997	FY 1998	Outyear	Construction Start - Completion
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1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

\$3,080	\$3,080	\$0	\$0	\$0	\$0	Subproject Completed
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FY 1989 Projects

Subproject 89-11: Lithium Process Replacement, Y-12 Plant, Oak Ridge, Tennessee

<u>Dates</u>	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
*	\$54,533	\$54,533	\$0	\$0	\$0	\$0	<u>Subproject Completed</u>

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

8. Project Description, Justification and Scope (Continued)

Subproject 89-12: Nuclear Facilities Modernization, Mound Plant, Miamisburg, Ohio

<u>Dates</u>	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
*	\$7,056	\$7,056	\$0	\$0	\$0	\$0	Subproject Completed

This subproject was directed to be canceled and closed-out by the Assistant Secretary for Defense Programs (ASDP) in February, 1992, in response to the Nuclear Weapons Reduction Initiative. Two sub-tasks within this project, "Hot Side Chilled Water System" and "Replacement of two PCB Transformers" were approved for completion because these two sub-tasks are required regardless of the completion of the major subproject.

Subproject 89-13: Replace Microminiature Electronics, Kansas City Plant, Kansas City, Missouri

<u>Dates</u>	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	\$29,100	\$29,100	\$0	\$0	\$0	\$0	1st Qtr FY 1989 - 1st Qtr FY 1997

This subproject will replace the existing microminiature electronics assembly facility at the Kansas City Plant (KCP) by constructing new facilities within the main manufacturing building and relocating current operations. The new facility will total approximately 31,000 square feet of usable production area on the factory floor plus approximately 23,500 square feet of equipment platforms and utility tunnels (basement). The new facility will provide capability and capacity for the development and production of thin-film and thick-film networks for hybrid microcircuits (HMC); this HMC production facility is the only one of its type within the nuclear weapons production complex. The existing cleanroom facility has exceeded its normal life expectancy, is losing its capability to maintain cleanliness at the Class 10,000 control level, and is several generations behind modern cleanroom technology making it technologically obsolete. Existing manufacturing processes used in the production of thin-film and thick-film electronics requires Class 100 cleanliness, 5 to 50 Hertz vibration control, and more stringent control of temperature and humidity. Currently, when the dust count exceeds the maximum allowed, production operations are suspended until control is regained by repairing equipment and manual wipe-down of cleanroom surfaces. Production interruption times range from a few hours to several days, during which production material and assemblies must be stored in closed containers and nitrogen pressurized storage cabinets.

Subproject 89-14: Replace Deionized Water System, Pinellas Plant, Clearwater, Florida

<u>Dates</u>	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	\$8,271	\$8,271	\$0	\$0	\$0	\$0	Subproject Completed

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

Subproject 89-15: Change House Replacement, Y-12 Plant, Oak Ridge, Tennessee

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
\$13,500	\$13,500	\$0	\$0	\$0	\$0	Subproject Completed

8. Project Description, Justification and Scope (Continued)

FY 1990 Projects

Subproject 90-16: Building Electrical Rehabilitation, Rocky Flats Plant, Golden, Colorado

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
\$0	\$0	\$0	\$0	\$0	\$0	Transferred to EM

Subproject 90-17: Production Plating Shop Replacement, Y-12 Plant, Oak Ridge, Tennessee

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
\$9,660	<u>\$18,400</u>	\$-8,740	\$0	\$0	\$0	Subproject Canceled

Subproject 90-18: In-Process Plutonium Staging Vault, Rocky Flats Plant, Golden, Colorado

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
\$2,070	\$2,070	\$0	\$0	\$0	\$0	Subproject Canceled

Subproject 90-19: Support Office Building, Rocky Flats Plant, Golden, Colorado

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
\$3	\$3	\$0	\$0	\$0	\$0	Subproject Canceled

Subproject 90-20: West Area Expansion, Rock Flats Plant, Golden, Colorado

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
\$0	\$0	\$0	\$0	\$0	\$0	Subproject Canceled

Subproject 90-21: Contractor Support Facility, Rocky Flats Plant, Golden, Colorado

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
\$0	\$0	\$0	\$0	\$0	\$0	Subproject Canceled

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

8. Project Description, Justification and Scope (Continued)

FY 1991 Projects

Subproject 91-22: Replace Electrical System Components, Kansas City Plant, Kansas City, Missouri

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
<u>Dates</u>							
*	\$12,700	\$12,700	\$0	\$0	\$0	\$0	<u>Subproject Completed</u>

Subproject 91-23: High Explosive Formulation Facility, Pantex Plant, Amarillo, Texas

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
<u>Dates</u>							
*	\$1,963	<u>\$1,963</u>	\$0	\$0	\$0	\$0	Subproject Canceled

Subproject 91-24: Renovate Water Supply System, Pantex Plant, Amarillo, Texas

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
<u>Dates</u>							
*	<u>\$10,050</u>	\$9,500	\$0	<u>\$550</u>	\$0	\$0	1st Qtr FY 1991 - <u>4th Qtr FY 1997</u>

This subproject will replace the primary water storage reservoir facility, substantially renovate the Zone 11 and 12 fire protection water system, and replace four inadequate wells. The present system does not provide adequate fire protection water supplies to 48 buildings in Pantex's Production and Development Zones (Zones 11 and 12, respectively) due to age of the key components and present system configuration. These areas deal extensively with high explosives and the fire protection supplies must be able to provide deluge water to any fire, quick, to protect critical production buildings.

Per pending BCP AL97001, the project forecast completion date to be extended to 4th Qtr. FY 1997 and the TEC to be increased because the development of the well took longer than originally scheduled and additional demolition costs for removal of obsolete buildings and equipment not previously planned for.

Subproject 91-25: Central Steam Plant Renovation, Rocky Flats Plant, Golden, Colorado

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
<u>Dates</u>							
	\$0	\$0	\$0	\$0	\$0	\$0	Transferred to EM

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

Subproject 91-26: Replace Graphite Dust Collection System, Y-12 Plant, Oak Ridge, Tennessee

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
<u>Dates</u>						
\$361	\$361	\$0	\$0	\$0	\$0	Subproject Canceled

1. Title and Location of Project: Program	2a. Project No. 88-D-122 (FCAP), Various Locations (Continued)	Facilities Capability Assurance 2b.
Construction Funded		

8. Project Description, Justification and Scope (Continued)

Subproject 91-27: Refurbishment Power Supply/Distribution System, Phase II, Y-12 Plant, Oak Ridge, Tennessee

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Construction Start - Completion</u> <u>Dates</u>
*	\$54,597	\$39,347	\$1,100	\$5,000	\$9,150	\$0	1st Qtr FY 1991 - 4th Qtr FY 1999
*		<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	
*							
*	Obligations 7/	\$39,347	\$1,100	\$5,000	\$8,550	\$600	

This project will refurbish the Y-12 electrical power supply/distribution system by: (1) restoring Elza I switchyard (the primary 161-Kv switchyard for Y-12 Plant); (2) refurbish electrical power control system (161-and 13.8-Kv); and (3) refurbish the secondary distribution system. These refurbishments must be done to provide the necessary reliability and maintainability required for weapons production at the Y-12 Plant and (4) consolidate switchgear from Building 9201-4.

* FY 1998 funds (\$8,550) will be used for Title I and Title II design for the electrical switch gear consolidation and
* construction activities.

Subproject 91-28: Site Electrical Replacements and Substation, Mound Plant, Miamisburg, Ohio

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u> <u>Dates</u>
	\$770	\$770	\$0	\$0	\$0	\$0	Subproject Canceled

Subproject 91-29: Replace Temperature and Humidity Conditioning Systems, Kansas City Plant, Kansas City, Missouri

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u> <u>Dates</u>
*	\$27,927	\$27,927	\$0	\$0	\$0	\$0	1st Qtr FY 1991 - 3rd Qtr FY 1998

This subproject will replace or restore the temperature and humidity control utility systems at the Kansas City Plant (KCP). Manufacturing operations at KCP rely heavily on stringent temperature and humidity controls to maintain close

7/ This obligation profile is added as an explanation of the proposed obligations for this subproject, based on the new full funding initiative. Item 7, Financial Schedule, does not show obligations for individual subprojects.

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

tolerances in mechanical and electronic weapons components. Approximately 90 percent of KCP's 3.2 million sq. ft. of floor space is temperature controlled at 74 degrees Fahrenheit +/- 7 degrees, and approximately 20 percent of KCP's floor space is humidity controlled to 50 percent relative humidity maximum. The systems

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

8. Project Description, Justification and Scope (Continued)

being replaced and upgraded have exceeded their useful life expectancies and are no longer functionally adequate to maintain these internal environment requirements during normal external winter (i.e., 2 degrees F) and summer conditions (i.e., 99+ degrees F with 70+ percent RH). The construction completion date was extended in approved BCP AL96021.

Subproject 91-30: Central Fire Station Emergency Operations Center, Pantex Plant, Amarillo, Texas

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion Dates</u>
\$8,000	\$8,000	\$0	\$0	\$0	\$0	2nd Qtr FY 1994 - 2nd Qtr FY 1996

This subproject will design and construct a new Central Fire Station to replace inadequate, overcrowded facilities for the fire department's present operations. It will also replace current Emergency Operations Center (EOC) facilities with adequate facilities that comply with current DOE requirements. Since many of the support facilities for the EOC (e.g., kitchen, sleeping area, exercise area, showers, and emergency communication and power) are basic requirements for the fire department, it is cost effective to combine these two functions into a common facility.

* The project forecast completion date to be extended to 2nd Qtr. FY 1997 and identified as a schedule variance per pending
* BCP AL97002.

FY 1992 Projects

Subproject 92-31: Replace/Refurbish Deteriorated Elevators, Y-12 Plant, Oak Ridge, Tennessee

<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion Dates</u>
<u>\$420</u>	<u>\$6,220</u>	\$2,200	<u>\$1,000</u>	\$0	\$0	1st Qtr FY 1992 - 2nd Qtr FY 1998

This subproject will replace or refurbish elevators in the production/production support buildings. These elevators are a primary and necessary means for transporting weapons-related materials and assemblies from one manufacturing area to another within the production/production support buildings. These 1940 vintage elevators are presently unreliable and interrupt the flow of manufactured components when inoperative. Significant maintenance and the fabrication of unavailable, obsolete parts are required to keep the elevators operational.

* BCP AL96030 was approved to reduce the TEC and revise the funding profile.

This subproject is a phase repair/replacement effort. As guidance is received at Oak Ridge from DOE/HQ for downsizing activities, Oak Ridge evaluates the Y-12 site requirements and determines which facilities will remain active and that in

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

turn determines which elevators require refurbishment. This course of action reduces the possibility of refurbishing an elevator in a facility determined to be decommissioned.

The alternative to upgrading and/or replacing the existing elevators as proposed is to continue maintaining and repairing the elevators until they have to be shut down. This is unacceptable due to the increased safety and security risk incurred to move weapon parts and production personnel between floors.

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

8. Project Description, Justification and Scope (Continued)

Subproject 92-32: Tritium Shipping Container Facility, Savannah River Site, Aiken, South Carolina

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>		<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>Dates</u>							
*	\$100	<u>\$100</u>	\$0	\$0	\$0	\$0		Subproject Canceled

FY 1993 Projects

Subproject 93-33: Plutonium Facilities HVAC Restoration, Rocky Flats Plant, Golden, Colorado

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>		<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>Dates</u>							
	\$0	\$0	\$0	\$0	\$0	\$0		Transferred to EM

Subproject 93-34: Replace Deteriorated Facilities, Y-12 Plant, Oak Ridge, Tennessee

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>		<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
	<u>Dates</u>							
	\$0	\$0	\$0	\$0	\$0	\$0		Subproject Canceled

Subproject 93-35: Upgrade Materials Engineering Laboratory, Kansas City Plant, Kansas City, Missouri

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>		<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	<u>Construction Start - Completion</u>
	<u>Dates</u>							
*	<u>\$11,700</u>	\$5,360	\$0	\$2,470	<u>\$3,870</u>		<u>\$0</u>	1st Qtr FY 1996 - <u>3rd Qtr FY 2000</u>
*		<u>Previous</u>	<u>FY 1996</u>		<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	
*								
*	Obligations 7/	\$5,360		<u>\$0</u>	<u>\$2,470</u>	<u>\$3,870</u>	<u>\$0</u>	

7/ This obligation profile is added as an explanation of the proposed obligations for this subproject, based on the new full funding initiative. Item 7, Financial Schedule, does not show obligations for individual subprojects.

1. Title and Location of Project: Program	2a. Project No. 88-D-122 (FCAP), Various Locations (Continued)	Facilities Capability Assurance 2b.
Construction Funded		

This subproject will upgrade the Materials Engineering Laboratory capabilities at the Kansas City Plant (KCP). Based on a Value Engineering Study, current mission guidance, and downsizing activities at KCP the location of this project is recommended to be changed from renovating and adding a 2-story prefabricated building at the North Wing Laboratory Building 86 to renovating space within the Manufacturing Support Building (MSB), Building 13. The mission and requirements for this project have been revalidated and rejustified and are required for current mission activities. The site location was changed, the scope adjusted, and the TEC reduced (-\$1,500,000) by approved BCP AL96019. These changes were made to comply with current DOE complex mission directions.

8. Project Description, Justification and Scope (Continued)

The new Materials Engineering Laboratory will be constructed in approximately 24,500 square feet of existing space in the Manufacturing Support Building (MSB), Building 13. This location will co-locate the laboratory with the existing Analytical Science Laboratory in the MSB, offering efficiencies and synergy through common staffing and equipment. Upon completion of the new laboratory in the MSB, the existing laboratory in Building 86 will be vacated, returning Building 86 to an open high bay space available for other uses. Contaminated exhaust ductwork and fans, asbestos, containing materials and excess equipment, furnishings, and associated utilities in the old laboratory area will be removed following the laboratory relocation to the new facility location.

The new laboratory facility will be designed to meet the requirements of the National Fire Protection Association (NFPA) 45 - Fire Protection for Laboratories Using Chemicals and will combine the two laboratory office areas and rearrange the existing materials engineering laboratory into separate areas by type and function. A new chemical storage room with perimeter exhaust and curbing is included. Interior structures, and systems/components will be installed in accordance with the latest DOE orders, Uniform Building Code, and the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) recommendations for general use facilities.

* BCP AL96019 was approved to reduce the TEC, revise the funding profile and extend the schedule.

Subproject 93-36: Investment Casting Furnace Facility, Sandia National Laboratories, Albuquerque, New Mexico

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
<u>Dates</u>							
*	\$3,660	\$3,660	\$0	\$0	\$0	\$0	<u>Subproject Completed</u>

FY 1994 Projects

Subproject 94-37: Chilled Water System Replacement, Kansas City Plant, Kansas City, Missouri

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
<u>Dates</u>							

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

* \$6,200 \$8,700 \$-2,000 \$-500 \$0 \$0 2nd Qtr FY 1995 - 2nd Qtr FY 1998

This subproject will provide a new Central Chilled Water Plant in an existing building centrally located on the north wall of the Main Manufacturing Building. Two chillers currently located in the East Boilerhouse and two chillers currently located in the West Boilerhouse will be removed and replaced with five new 1,200-ton chillers and associated pumps, piping, and controls installed in the new Chilled Water Plant. The new Central Chilled Water plant will include space for one additional 1,200-ton chiller. Cooling towers, condenser water pumps and electrical substations will be installed outside, adjacent to the building. A direct digital control system will be installed and connected to the East and West Boilerhouse for monitoring and coordination with the plant's chilled water system. Additionally, this project will replace six 20-ton, two 10-ton, and one 15-ton direct expansion (DX) air conditioning units with four new air handling units and one 15-ton DX unit with a new DX unit. The new air handling units will occupy the same locations as the old units, where possible, or will be installed on roof-mounted platforms requiring new chilled water and steam utility piping and duct modifications. Existing control systems will be replaced with direct digital control systems.

* This subproject was downscoped, the TEC reduced and the schedule extended per approved BCP AL96022.

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

8. Project Description, Justification and Scope (Continued)

Subproject 94-38 Roads and Parking Area Upgrades, Pantex Plant, Amarillo, Texas

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>		<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
<u>Dates</u>								
*	\$13,300	\$5,259	\$8,041	\$0	\$0	\$0		4th Qtr FY 1995 - 1st Qtr FY 1999

- * This subproject is to repair, replace, and upgrade approximately 14.27 miles of roads, approximately 56,127 square yards of parking areas and associated equipment at the Pantex Plant. These roads and equipment have exceeded their expected serviceable life by up to 25 years, and are significantly deteriorated.

Transportation requirements at Pantex Plant have altered significantly in the 45 years since the Plant was constructed. Many of the existing roads were constructed with 18-foot pavement width or less to carry two-way traffic, which is much too narrow by today's standards. Changing production, security and fire protection requirements, increased volume of traffic, and increased size and weight of vehicles since the plant was constructed have all contributed to the inadequacy of existing roads at the Pantex Plant. Now that many of the roads have surpassed their serviceable lives and must be reconstructed, the road and parking areas should be located so as to optimize plant operations. This project will provide a long range traffic plan as a necessary part of the design. Signage and pavement marking on Pantex Plant roads and parking areas are not consistent. Part of the design process for this project will be to adapt the recommendations and requirements of the Department of Transportation "Manual on Uniform Traffic Control Devices" to the requirements of the Plant.

Maintaining a good surface course on pavements at Pantex is especially critical due to poor drainage caused by the extremely flat terrain at the plant. Water from heavy snow storms and rains must be kept away from the pavement base and sub-base courses if the pavement is not to fail prematurely.

- * The funding profile, schedule and scope changed per approved BCP AL96017 (revised).

FY 1995 Projects

Subproject 95-39: Replacement of Compressed Air System, Pantex Plant, Amarillo, Texas

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>		<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
<u>Dates</u>								
	\$3,900	\$410	\$420	\$3,070	\$0	\$0		1st Qtr FY 1997 - 2nd Qtr FY 1998

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

The Pantex Plant was built in the early 1940s and modified in 1951 to produce nuclear weapons. The existing compressed air piping system in both Zone 11 and 12 is undersized due to changes in building function and plant expansion over the past several years. Satellite (back-up) compressor stations are presently being used to provide good quality (dry, oil free) compressed air to buildings. There are currently 15 satellite compressors in Zone 11 and 88 in Zone 12. An estimated 25% reduction in maintenance costs will be realized when this project is completed.

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

8. Project Description, Justification and Scope (Continued)

Subproject 95-40: Replace Firemains, Kansas City Plant, Kansas City, Missouri

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
<u>Dates</u>							
*	\$4,300	\$4,900	\$0	\$-600	\$0	\$0	3rd Qtr FY 1996 - 4th Qtr FY 1998

Sections of the existing fire protection sprinkler supply mains, some exterior underground and some interior overhead, will be replaced with new cement lined pipe to prevent corrosion, tuberculocution which has developed in the existing unlined pipe. The fire main to be replaced inside the main manufacturing building includes approximately 2,300 feet of 10-inch diameter, schedule 40 steel pipe. The underground cross main include includes approximately 400 feet of 8-inch diameter ductile iron pipe. All of this firemain replacement will be with cement lined pipe and will include replacement of appropriate valves and fittings. The underground piping for the four (4) sprinkler lead-ins involves approximately 300 feet of 10-inch diameter pipe and 400 feet of 8-inch diameter pipe.

FY 1996 Projects

Subproject 96-41: Replace Cooling Tower, East, Kansas City Plant, Kansas City, Missouri

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
<u>Dates</u>							
	\$5,020	\$0	\$1,570	\$3,450	\$0	\$0	3rd Qtr FY 1997 - 3rd Qtr FY 1998

This subproject will combine and upgrade two of the separate and deteriorated condenser water systems at the East Boilerhouse. This will be accomplished by replacing the existing 5-cell center and 2-cell west cooling towers, six condenser water pumps, five variable speed pump drives, related electrical equipment and circuitry, two basin dewatering pumps, and the direct digital control (DDC) system for the condenser water; and by interconnecting the west and center cooling tower cold water basins and the condenser water piping. This will allow operation of combinations of chiller(s), tower(s), and pump(s). The new DDC system will control the tower fans, riser valves, pumps and monitors the performance of the condenser water systems.

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

8. Project Description, Justification and Scope (Continued)

FY 1997 Projects

Subproject 97-42: Hydraulic Press, Y-12 Plant, Oak Ridge, Tennessee

	<u>TEC</u>	<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>Outyear</u>	<u>Construction Start - Completion</u>
<u>Dates</u>							
*	\$14,000	\$0	\$0	\$7,500	<u>\$6,500</u>	<u>\$0</u>	1st Qtr FY 1998 - 4th Qtr FY 1999
*		<u>Previous</u>	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY 1998</u>	<u>FY 1999</u>	
*							
*	Obligations 7/	<u>\$0</u>	<u>\$0</u>	<u>\$7,000</u>	<u>\$7,000</u>	<u>\$0</u>	

This subproject will procure and install a new 3,500 ton press to forge billets and form machine blanks and will replace the 1,000, 1,500, and 7,500 ton presses in Building 9204-4. The press will be located in F-Area of Building 9998. Building 9998 will need extensive modifications to accommodate the new press. The equipment exhaust will be connected to the existing High Efficiency Particulate Air (HEPA) filter system. The floor will be modified to incorporate a pit and the building height will be increased. The building steel will be reinforced to facilitate press loading and utility services will be extended from existing headers in the area.

* The FY 1998 obligations will provide for Titles I and II engineering, construction activities, and the procurement of the new press.

This subproject is required to support Defense Programs consolidation by completion of the equipment requirements for the depleted Uranium and Uranium alloy capabilities. This project will ensure the requirement to maintain nuclear competence. It is required to fully realize annual operating cost reductions. The project supports expected enhancements in worker health and safety by reducing potential exposure to airborne radioactive material, elimination of point of operation risks (OSHA), and elimination of administrative controls by installation of physically engineered controls to prevent worker exposure to hazardous operations and materials.

7/ This obligation profile is added as an explanation of the proposed obligations for this subproject, based on the new full funding initiative. Item 7, Financial Schedule, does not show obligations for individual subprojects.

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

9. Details of Cost Estimate

This cost estimate is based upon completed conceptual design reports and current funding profiles for all FCAP subprojects.

	FY 1988 <u>Subprojects</u>	FY 1989 <u>Subprojects</u>	FY 1990 <u>Subprojects</u>	FY 1991 <u>Subprojects</u>	FY 1992 <u>Subprojects</u>	FY 1993 <u>Subprojects</u>	FY 1994 <u>Subprojects</u>
a. Engineering, design, and inspection and their percentage of construction costs, item b	\$ 5,700	\$ 19,970	\$ 1,828	\$ 13,940	\$ 2,100	\$ 1,500	
\$ 1,240							
b. Construction costs (incl. spec. eqmt. e.g., gloveboxes)	56,450	69,020	6,915	81,208	5,975	8,400	13,890
c. Standard equipment	14,900	5,555	0	0	0	2,780	335
d. Other (incl Prog & Const Mgmt)		<u>3,950</u>	<u>3,614</u>	<u>1,340</u>	<u>5,035</u>		<u>955</u>
440	865						
Subtotal	\$ <u>81,000</u>	\$ <u>98,159</u>	\$ <u>10,083</u>	\$100,183	\$ 9,030	\$ 13,120	\$ 16,330
Contingency @ % of [a+b+c+d] cost	<u>5,563</u>	<u>14,301</u>	<u>1,650</u>	<u>16,185</u>	<u>490</u>		<u>2,240</u>
3,170							
Total estimated construction cost (TEC)			\$ <u>86,563</u>	\$ <u>112,460</u>		\$ <u>11,733</u>	\$ <u>116,368</u>
\$ <u>9,520</u>	\$ <u>15,360</u>	\$ <u>19,500</u>					
	FY 1995 <u>Subprojects</u>	FY 1996 <u>Subproject</u>	FY 1997 <u>Subproject</u>				
a. Engineering, design, and inspection and their percentage of construction costs, item b	\$ 660	\$ 570	\$ 1,020				
b. Construction costs (incl. spec. eqmt. e.g., gloveboxes)	5,640	3,050	10,550				
c. Standard equipment	0	0	0				
d. Other (incl Prog & Const Mgmt)		<u>600</u>	<u>400</u>	<u>100</u>			
Subtotal	\$ 6,900	\$ 4,020	\$ 11,670				
Contingency @ % of [a+b+c+d] cost	<u>1,300</u>	<u>1,000</u>	<u>2,330</u>				
Total estimated construction cost (TEC)			\$ <u>8,200</u>	\$ <u>5,020</u>	\$ <u>14,000</u>		

1. Title and Location of Project:	Facilities Capability Assurance
Program	2a. Project No. 88-D-122
	(FCAP), Various Locations (Continued)
Construction Funded	2b.

9. Details of Cost Estimate (Continued)

Actual and planned allocation by location for fiscal year funds:

	FY 1988/		CUMULATIVE			
	<u>FY 1994</u>	<u>FY 1995</u>	<u>FY 1996</u>	<u>FY 1997</u>		
	<u>FY 1998</u>	<u>FY 1999</u>	<u>ALL FYs</u>			
Kansas City Plant, Kansas City, MO	\$ 87,479	\$ 6,010	\$ -430	\$ 4,820	\$ 3,870	\$ 0
Pinellas Plant, Clearwater, FL	11,203	-2	0	0	0	0
Pantex Plant, Amarillo, TX	52,820	2,312	8,461	3,620	0	0
Mound Plant, Miamisburg, OH	14,909	0	0	0	0	0
Rocky Flats Plant, Golden, CO	7,913	0	0	0	0	0
Y-12 Plant, Oak Ridge, TN	145,169	5,400	-5,440	13,500	15,050	600
Sandia National Lab., Albuquerque, NM	21,360	0	0	0	0	0
Savannah River Site, Aiken, SC	5,000	-4,900	0	0	0	0
Total allocations by fiscal year	<u>\$345,853</u>	<u>\$ 8,820</u>	<u>\$ 2,591</u>	<u>\$ 21,940</u>	<u>\$ 18,920</u>	<u>\$ 600</u>
						<u>\$398,724</u>

10. Method of Performance

Design and procurement of these facilities will be performed under negotiated architect-engineer contracts. To the extent feasible, construction and procurement will be accomplished by fixed-price contracts and subcontracts awarded on the basis of competitive bidding.

11. Schedule of Project Funding and Other Related Funding Requirements

	<u>Prior</u>	<u>FY 1996</u>	<u>FY 1997</u>
	<u>Years</u>	<u>FY 1999</u>	<u>Total</u>
	<u>FY 1998</u>		
a. Total project costs			
1. Total facility costs			
(a) Construction line item	\$ 274,161	\$ 28,459	\$ 45,080
Total facility costs	\$ 274,161	\$ 28,459	\$ 45,080
2. Other project costs			
(a)	Conceptual design reports, studies, and site		
	characterization	\$ 1,000	\$ 955
	20,985		\$ 1,106
(b) ES&H and start-up documentation	14,420	3,495	3,750
Total other project funding	\$ 31,995	\$ 4,495	\$ 4,705
			\$ 4,336
			\$ 1,369
			\$ 46,900

1. Title and Location of Project:		Facilities Capability Assurance					
Program	2a. Project No. 88-D-122 (FCAP), Various Locations (Continued)	2b.					
Construction Funded							
Total project costs		\$ <u>306,156</u>	\$ <u>32,954</u>	\$ <u>49,785</u>	\$ <u>34,607</u>	\$ <u>22,122</u>	\$ <u>445,624</u>

1. Title and Location of Project: Program	2a. Project No. 88-D-122 (FCAP), Various Locations (Continued)	Facilities Capability Assurance 2b.
Construction Funded		

12. Narrative Explanation of Total Project Funding and Other Related Funding Requirements

- a. Total project funding
 - 1. Total facility costs
This represents normal engineering design, procurement, construction, and inspection of utility and construction projects of this size, range, and complexity.
 - 2. Other project costs
 - (a) Conceptual design report (CDR) costs are included for 41 ongoing subprojects. CDR costs are not included for subprojects being developed but not in this data sheet. CDR preparation is averaging one percent (1%) of the total estimated construction cost (TEC); follow-on studies and site characterization activities that must be accomplished during Title I & II design average an additional one percent (1%) of the TEC.
 - (b) ES&H documentation and reporting has become more intense; this includes environmental documentation (EA's or EIS's) and health and safety documentation (SA's, PSAR's, SAR's, et al) which usually must be completed before construction can be started. These activities average from one to five percent (1% - 5%) of the subproject TEC.

Start-up documentation and reporting requirements have increased significantly. These include operational readiness reviews, operating procedure reports, operating safety reviews, et al; these costs are as much as 25% of the subproject TEC for complex, specialized facilities and processes, both nuclear and non-nuclear, and the action must be completed before the facilities can be placed in operation.

b. Related annual costs

Estimated programmatic lives of these facilities vary by site and by subproject. The other related funding requirements for these facilities are not considered to be significantly different from those of the facilities being replaced by this program. Therefore, no costs are shown.

WEAPONS PROGRAM DIRECTION
PROGRAM FUNDING PROFILE
(Dollars in Thousands)

Sub-Program	FY 1996 Enacted Appropriation	FY 1996 Comparable To FY 1997	FY 1997 Enacted Appropriation	FY 1998 Budget Request	FY 1999 Budget Request
Program Direction					
Operations & Maintenance	\$ 114,774	\$ 324,873	\$ 325,600	\$ 303,500	\$
Adjustment	(13,400) a/	(13,400) a/	0	0	
Subtotal, Directed Program	\$ 101,374	\$ 311,473	\$ 325,600	\$ 303,500	\$ 300,000
Comparability Adjustment		(210,099) b/	0	0	
NEW BUDGET AUTHORITY (Noncomparable)	\$ 101,374 c/	\$ 101,374 c/	\$ 325,600	\$ 303,500	\$ 300,000
Summary					
Federal and Contractual Support	\$ 103,484	\$ 279,646	\$ 255,487	\$ 256,279	\$
Transportation Safeguards Program	0	27,325	29,683	30,971	
Working Capital Fund	0	6,612	6,540	7,000	
Los Alamos Community Assistance Program	11,290	11,290	33,890	9,250	
Subtotal, Weapons Program Direction (Comparable)	\$ 114,774	\$ 324,873	\$ 325,600	\$ 303,500	\$ 300,000
Staffing (FTE's)					
HQ FTE's	225	359	335	290	
Field FTE's	702	1,710	1,687	1,635	
Total FTE's	927	2,069 d/	2,022	1,925 e/	

Footnotes

a/ Use of prior year balances.

b/ Adjustments as follows: Transfer to Weapons Program Direction for Federal and Contractual Support as directed in Conference Report 104-293 accompanying the FY 1996 Energy and Water Development Appropriations Bill dated October 26, 1995, as follows: \$47,106,000 from Stockpile Stewardship and \$157,381,000 from Stockpile Management. Reflects the transfer of \$6,612,000 from Departmental Administration for the Working Capital Fund. Appropriation transfer of \$1,000,000 to the Office of the Assistant Secretary for Environment, Safety and Health for the Defense Nuclear Facilities Safety Board within the Other Defense Activities Appropriation.

c/ FY 1996 Appropriation of \$115,000,000 less \$13,400,000 use of prior year balances and \$226,000 for the Omnibus Consolidated Rescissions and Appropriations Act of 1996.

d/ Reflects the usage of 1 FTE for the Defense Nuclear Facilities Safety Board and 10 for National Security.

e/ Does not reflect FTE's for Technical Leadership Development Program (interns); FY 1997 - 12 FTE's and FY 1998 - 14 FTE's.

DEPARTMENT OF ENERGY
FY 1998/FY 1999 CONGRESSIONAL BUDGET REQUEST
WEAPONS ACTIVITIES
(Tabular dollars in thousands, Narrative in whole dollars)

PROGRAM DIRECTION
PROGRAM MISSION

Note: Detailed site funding for Weapons Program Direction is provided in the Defense Programs Executive Budget Summary.

Program Direction provides funds for all personnel-related expenses, capital equipment, and contractual services for Defense Programs offices at the Department of Energy (DOE) Headquarters and the Albuquerque, Nevada, Oak Ridge, Oakland, and Savannah River Operations Offices. At the Albuquerque and Nevada Operations Offices, Defense Programs also provides for technical and administrative federal support for other DOE programs. Funding is also provided for technical support throughout the Defense Programs complex in the areas of environment, safety, and health; safeguards and security; National Environmental Policy Act compliance; and compliance with Federal and state legislation, response to Defense Nuclear Facilities Safety Board recommendations, Departmental Executive Orders, and Departmental Strategic Alignment Initiatives (SAI). The Working Capital Fund, established to fund business-type activities traditionally financed in the Departmental Administration account, is funded from this decision unit. The Community Assistance Program at Los Alamos, New Mexico, is also funded from Program Direction.

GOALS:

Provide oversight of Defense Programs changing mission which has shifted from weapons and materials design, testing, and production to stockpile stewardship, maintenance, weapons dismantlement and the transition of unneeded facilities. These ongoing responsibilities will be accomplished by streamlining and strengthening the management, organization, performance, and oversight of the Defense Programs national security activities by providing competent and sufficient staff and support services to carry out successfully assigned activities.

PERFORMANCE MEASURES:

- Provide management and oversight of the \$1.8 billion Stockpile Stewardship program and \$2.0 billion Stockpile Management program.
- Provide Federal couriers and personnel-related costs for the Transportation Safeguards Program at Albuquerque.
- Provide Defense Programs assessment related to the Department's Working Capital Fund which established a centralized mechanism to provide common administrative services throughout the Department.
- Provide for statutory requirements, including carrying out recommendations in the reports to Congress on assistance payments to Los Alamos, New Mexico.

SIGNIFICANT ACCOMPLISHMENTS AND PROGRAM SHIFTS:

FY 1996

- Completed the Stockpile Stewardship and Management Programmatic Environmental Impact Statement, obtaining a Record of Decision in December 1996.
- Streamlined Defense Programs organizations at Headquarters by reducing the full-time equivalents level by 29%, 495 to 348, between FY 1992 and FY 1996 and redeployed staff to meet evolving needs.
- Met established Strategic Alignment Initiative target reductions in support services contracting and travel at Headquarters and field locations.
- Consistent with Departmental guidance, instituted a process by which office products and services are procured through the use of credit cards.
- Continued to reduce organizational elements at Headquarters, resulting in a reduction of managers/supervisors from 89 to 28, with a ratio of supervisors to employees of 1:12.
- Met the Departmental milestone to establish a Technical Qualification Program.
- Established a Core Technical Group, based at Headquarters, to respond to technical problems throughout the Weapons complex; i.e., environment, safety and health and safeguards and security reviews and/or assessments, to be fully implemented in FY 1997.
- Established an organization within Defense Programs to insure sufficient computational capability is available to support increased requirements of science-based Stockpile Stewardship.
- Upgraded the Defense Programs Local Area Network system; i.e., implemented high speed remote connectivity to provide mobile users full capability and functionality.
- Developed the EXTRANET to provide seamless transfer of electronic documents and a collaborative work environment across the Defense Programs complex.
- Established a Learning Center for Leadership to improve the overall managerial competencies of Defense Programs managers and supervisors.
- Established a training data information system.

FY 1997/FY 1998

- The Office of Management and Administration at Albuquerque will implement the acquisition procurement electronics system (APES) to provide customers with real time information. APES eliminates the need for duplicate systems and redundant data entry, resulting in significant cost savings of approximately \$325,000 for the first year and \$651,000 annually thereafter.
- Nevada will move Federal staff and most contractual support staff from leased space into the new federally owned Nevada Support Facility.
- Oakland will adopt safeguards and security oversight to meet Departmental business plans for all contractor sites.
- Oakland will provide technical guidance to Lawrence Livermore National Laboratory on the implementation of improved safety authorization basis requirements in the Plutonium Facility, including addressing Defense Nuclear Facilities Safety Board concerns, allowing it to restart and continue operations.
- Continue reductions in support services contracting and travel at Headquarters and field locations.
- Continue to meet SAI employment targets.
- At Albuquerque, streamline the acquisition process for support services contracts to reduce cycle time, improve customer satisfaction, and reduce costs.
- Oak Ridge will continue implementation of the Safety Analysis Upgrade Program and the Radiation Control Implementation Plan. In FY 1998, successfully start up Phase A of enriched uranium operation.
- Provide final Community Assistance payment for the County of Los Alamos, New Mexico.
- Manage newly generated waste pilot project.

BUDGET STRUCTURE

In accordance with guidance contained in H.R. 104-293, FY 1996 Energy and Water Development Appropriations Conference Report, those portions of the Defense Programs Federal staff and supporting contractual services funded within the Stockpile Stewardship and Stockpile Management decision units were reallocated to the Program Direction decision unit in FY 1997. The Department's Working Capital Fund was also established in FY 1997 to fund business-type activities.

FEDERAL AND CONTRACTUAL SUPPORT provides funds for general management, executive direction, technical support, and general supervision of program operations, negotiations and administration of contracts, and other administrative activities in support of Defense Programs mission at Headquarters and throughout the Weapons Complex. Supports Defense Programs requirements for Automated Office Support Systems, Local Area Network, communication and video equipment, and other miscellaneous contractual support activities to support Defense Programs operations.

TRANSPORTATION SAFEGUARDS PROGRAM provides funding for Federal full-time equivalents (FTE's) and related contractual support to assure the safe, secure movement of nuclear weapons, strategic quantities of Special Nuclear Material, nuclear test devices, selected nonnuclear weapon components, and limited-life components to and from military locations and between nuclear complex facilities within the continental United States. Operational vehicles and the communications maintenance program are funded in the Stockpile Management Decision Unit.

WORKING CAPITAL FUND provides for common administrative-type services at DOE Headquarters such as building occupancy, communications, networking, printing and graphics, photocopying, audits and contract closeouts, historically funded in the Departmental Administrative account. Beginning in FY 1998, this fund also includes an assessment for payroll and personnel costs. Responsibility for funding of these activities has been transferred to the Department's program offices; however, management will remain with the Office of Human Resources and Administration.

LOS ALAMOS COMMUNITY ASSISTANCE PROGRAM is administered by the Department under Section 91 of Public Law 94-187, the Atomic Energy Community Act of 1955, as amended, to provide assistance to specified units of local government in the Los Alamos community associated with the Los Alamos National Laboratory. The Los Alamos Community Assistance Program provides assistance payments to the Los Alamos County and the Los Alamos School Board to compensate for the lack of an industrial or commercial tax base for the county. The contracts with the Los Alamos County municipalities and the Los Alamos County School Board expired June 30, 1996. By authority of Public Law 104-106, FY 1996 National Defense Authorization Act, dated February 10, 1996, assistance payments are authorized to continue through June 30, 1997. In accordance with Congressional guidance, DOE is to carry out the recommendations in the reports to Congress relating to future Federal assistance for this program.

WEAPONS PROGRAM DIRECTION
Funding by Category/Site
FY 1996 - FY 1998
(\$ in Thousands)

[See following page of Explanation of Changes]

FY 1996 (Comparable)	Total	Headquarters	Albuquerque	Transportation Safeguards-AL	Nevada	Oakland	Oak Ridge	Savannah River
Salary and Benefits	154,724	36,631	60,645	24,020	20,757	6,190	5,090	1,391
Travel	12,239	3,989	3,493	3,000	701	773	208	75
Support Services	71,006	28,964	29,825	0	5,623	3,515	2,677	402
Other Related Expenses	69,002	23,809	28,434	305	11,823	2,253	2,181	197
Community Assistance	11,290		11,290					
Working Capital Fund	6,612	6,612						
Subtotal	324,873	100,005	133,687	27,325	38,904	12,731	10,156	2,065
Adjustments	(13,400)							
TOTAL	311,473	100,005	133,687	27,325	38,904	12,731	10,156	2,065
FTE's	2,069	359 b/	875	361	301	86	72	15

FY 1997	Total	Headquarters	Albuquerque	Transportation Safeguards-AL	Nevada	Oakland	Oak Ridge	Savannah River
Salary and Benefits	151,194	33,104	58,864	26,036	20,400	6,507	4,951	1,332
Travel	11,518	2,726	3,738	3,262	800	532	245	215
Support Services	53,238	15,964 c/	26,750	0	5,000	2,706	2,500	318
Other Related Expenses	69,220	30,673	22,829	385	10,199	2,683	2,386	65
Community Assistance	33,890		33,890					
Working Capital Fund	6,540	6,540						
TOTAL	325,600	89,007	146,071	29,683	36,399	12,428	10,082	1,930
FTE's a/	2,022	335	885	355	279	80	70	18

FY 1998	Total	Headquarters	Albuquerque	Transportation Safeguards-AL	Nevada	Oakland	Oak Ridge	Savannah River
Salary and Benefits	154,942	34,104	60,439	27,161	20,243	6,675	4,950	1,370
Travel	11,620	2,800	3,600	3,400	775	550	245	250
Support Services	55,694	20,962 d/	24,000	0	5,300	2,812	2,302	318
Other Related Expenses	64,994	25,100	23,885	410	10,268	2,300	2,949	82
Community Assistance	9,250		9,250					
Working Capital Fund	7,000	7,000						
TOTAL	303,500	89,966	121,174	30,971	36,586	12,337	10,446	2,020
FTE's a/	1,925	290	870	355	249	77	66	18

a/ Does not reflect FTE's for Technical Leadership Development Program (interns); FY 1997 - 12 FTE's and FY 1998 - 14 FTE's.

b/ Reflects the usage of 1 FTE for the Defense Nuclear Facilities Safety Board and 10 for National Security.

c/ Reflects use of new budget authority. An additional \$9 million of prior year balances were redirected to this activity to support an obligational level of \$24,964,000.

d/ Reflects a 16 percent reduction from FY 1997 total obligational authority; see note c/.

EXPLANATION OF CHANGES TO FUNDING BY CATEGORY/SITE:

Salaries and Benefits increases \$3,748,000 from FY 1997 to FY 1998, although FTE's are declining within Defense Programs. This apparent contradiction results from the need to provide salary and benefit support for employees until the time of their separation from Federal employment and by increased overtime costs associated with the Transportation Safeguards program support of additional courier activity required to support the weapons dismantlement schedule. Upward pressure also results from increasing salary and benefits costs. In addition, \$500,000 of the increase is associated with the one-year pilot program to re-engineer waste management within the Department; 5 Albuquerque FTE's have been transferred to Defense Programs from the Office of Environmental Management as part of this pilot program. Salary includes compensation for regular salaries and wages, other payments that become a part of the employee's basic pay rate (geographic differentials and nationwide pay raises), and other personnel compensation such as overtime, holiday pay, Sunday pay, and cash incentive awards. Benefits includes allowances for relocation and other expenses related to permanent change of station (PCS) and payments for the employer's share of employee retirement, health and life insurance, accident compensation, Federal Insurance Contribution Act taxes, and Federal Retirement Thrift Savings Plan. Benefits also includes payments for former employees such as severance pay, lump sum payments for accrued annual leave, pay to employees involuntarily separated, and voluntary separation incentives. Includes payments to the unemployment fund, payments of 9 percent of final basic pay to the civil service retirement fund for employees who took the early out or buy-out authority, and payments to the employees health benefits fund for annuitants.

The net increase to **Travel** is \$102,000. Reductions in travel resulting from reduced FTE's are offset by increases due to additional requirements associated with the Headquarters based Core Technical Group, to respond to technical problems throughout the Weapons Complex; the Transportation Safeguards Division increased movement of weapons for dismantlement resulting in a significant increase in Federal courier travel costs; and increased travel by Savannah River Operation Office FTE's in support of the dual track tritium strategy. Travel includes funding for the transportation of Government employees, their per diem allowances while in authorized travel status, and other expenses incidental to travel. Travel also includes transportation of things; an example, the transportation of household goods related to permanent change of station.

Control of advisory and assistance **Support Services** costs is a key aspect of the Strategic Alignment Initiative. Support services are grouped into two categories: technical support services and management support services. Technical support includes services to determine feasibility of design considerations, development of specifications, system definition, system review and reliability analyses, economic and environmental analyses, test and evaluation, surveys or reviews to improve the effectiveness, efficiency, and economy of technical operations. The Management Support services include analysis of workload and work flow, directives management studies, automatic data processing, manpower systems analyses, assistance in the preparation of programs plans, training and education, and any other reports or analyses directed toward improving the effectiveness, efficiency, and economy of management and general services. A corporate review group has been formed in Defense Programs to address goals for reducing and controlling these costs. Defense Programs support services contracts decrease by 21 percent, \$15,322,000, from FY 1996 to FY 1998. An apparent increase from FY 1997 to FY 1998 of about \$2.4 million is the result of a deliberate underfunding in new budget authority for support services at Headquarters in FY 1997 by \$9 million in order to draw down prior year uncosted balances in this category to an acceptable level by the end of FY 1997. Including the \$9 million, there is a decrease in the effective level of support services in FY 1998 of about 10 percent.

Other Related Activities includes all program direction costs not reported under salaries and benefits, travel, or support services. Includes landlord costs, rents and utilities, operation and maintenance of facilities, and miscellaneous charges, printing and reproduction, operation and maintenance of equipment, purchases of goods and services from government accounts, supplies and materials, and equipment. Defense Programs is the landlord for the Albuquerque and Nevada Operations Offices, whereas landlord costs are incurred by other programs at Oak Ridge, Oakland, and Savannah River. Headquarters is reduced by \$5,573,000 although this is partially offset by the field's increase of \$1,347,000 attributable to escalation associated with landlord and communications expenses. **Working Capital** reflects charges for the full cost of goods and services provided by the Working Capital Fund in support of Defense Programs. The Working Capital Fund includes building occupancy, communications, networking, printing and graphics, photocopying, audits and contract closeouts. The increase is associated with the addition of an assessment for departmental payroll and personnel system costs beginning in FY 1998. The decrease in the **Los Alamos Community Assistance Program** from FY 1997 is primarily attributable to the settlement payment to the Los Alamos County of \$22.6 million that is not repeated in FY 1998.

FEDERAL AND CONTRACTUAL SUPPORT provides funds for Federal salaries, personal services, personnel benefits, travel, training, supplies, and support services necessary to conduct Defense Programs activities at Headquarters and the Albuquerque, Nevada, Oak Ridge, Oakland, and Savannah River Operations Offices. Activities include general management, executive direction, general supervision of program operations, negotiation and administration of operating contractors and other procurements, weapons complex resource management and planning, technical oversight and review, and the conduct of special programs and activities.

PROGRAM GOALS AND ONGOING RESPONSIBILITIES:

Headquarters:

- Direct execution of nuclear weapons programs. Provide oversight to weapons facility activities in such areas as operational efficiency, safety and environmental compliance. Oversee nuclear weapons surety program. Manage activities dealing with nuclear and radiological emergencies within the United States and abroad. Coordinate technical input for the preparation of the annual Nuclear Weapons Stockpile Memorandum. Coordinate with the Nuclear Weapons Council and DOD on joint weapons stockpile issues.
- Provide programmatic and policy direction to Operations Offices and laboratories engaged in the science-based Stockpile Stewardship program. Direct the utilization of laser and particle beam initiated inertial fusion research. Oversee the National Ignition Facility project. Provide programmatic guidance in the development of technology transfer policy, procedures and guidelines. Insure that the laboratory technology base required for weapons surety, reliability, and military effectiveness and credibility is maintained.
- Provide policy guidance and programmatic and technical direction for the development of advanced computational capabilities for the weapons program. Oversee the development of advanced computational applications and codes for design, validation, and modeling of advanced manufacturing processes, and enterprise integration, and of high performance computers to accommodate virtual testing applications. Interface with national initiatives and programs in information and computing systems and technology.
- Direct the implementation of the dual-track strategy to ensure tritium availability, leading to a technology decision in 1998. Oversee the development of technologies required by the Accelerator Production of Tritium and the Commercial Light Water Reactor options. Provide for the infrastructure improvements to meet the tritium needs of the weapons stockpile required to support the dual-track strategy.

Field Offices:

- Albuquerque Operations Office - In conjunction with the Deputy Assistant Secretary for Military Application and Stockpile Management, provides for Federal programmatic oversight of the Core Stockpile Management program. Provides for Federal oversight of the Los Alamos National Laboratory, Sandia National Laboratories, Albuquerque, the Kansas City Plant, and the Pantex Plant through onsite area offices. Landlord of Albuquerque site, benefitting other DOE programs.
- Nevada Operations Office - Oversight and administration of the Stockpile Stewardship Program at the Nevada Test Site. Landlord at the Nevada site.
- Oak Ridge Operations Office - Federal oversight of the Y-12 Plant.
- Oakland Operations Office - Federal oversight of the Lawrence Livermore National Laboratory (LLNL) through the LLNL Site Office.
- Savannah River Operations Office - Federal oversight of tritium operations at the Savannah River Site.

CHANGE FROM FY 1997:

A detailed explanation of changes between FY 1997 and FY 1998 is provided on the previous page. Increase of \$500,000 associated with the re-engineering waste management pilot program. As part of a one-year pilot program to re-engineer waste management activities within the Department, there is a transfer of 5 Albuquerque FTE's to Defense Programs from the Office of Environmental Management responsible for overseeing waste management activities at the Kansas City Plant. If the pilot program is not continued into FY 1999, these FTE's will revert to EM.

FUNDING LEVELS:

\$279,646	\$255,487	\$256,279
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FEDERAL AND CONTRACTUAL SUPPORT

Program Direction

TRANSPORTATION SAFEGUARDS PROGRAM at the Albuquerque Operations Office provides for the safe, secure movement of nuclear weapons, strategic quantities of Special Nuclear Material, selected nonnuclear weapons components, and limited life components to and from military locations and between nuclear weapons complex facilities within the continental United States.

In compliance with FY 1997 Congressional direction that all Federal staff and supporting contractual services be consolidated into one decision unit, the full-time equivalents and associated costs for this program were transferred from the Stockpile Management decision unit. However, to carry out successfully the activities necessary to insure the safe transport of nuclear weapons between military locations, funding of the following direct costs of the Transportation Safeguards Division have remained in Stockpile Management: maintenance and modifications of vehicles and the communication system, production of new Safeguards Transporters, weapons deliveries and stockpile modifications specified in the current Production and Planning Directive, and continued support of weapons movements associated with military base closings. Total funding requested for this activity in FY 1998 is \$95.6 million -- \$30.9 million in Program Direction; \$64.7 million in Stockpile Management.

PROGRAM GOALS AND ONGOING RESPONSIBILITIES:

Provide for personnel costs and related administrative support activities in conjunction with the safe handling of nuclear weapons and related activities.

CHANGE FROM FY 1997:

Increase is attributable to the increased movement of weapons for dismantlement resulting in increased overtime payments for the federal couriers.

MEASURABLE PERFORMANCE ACTIVITIES:

<u>FY 1996:</u> Couriers safely handled 580 shipments, covering approximately 4.2 million miles, in support of this activity.	<u>FY 1997:</u> It is estimated that 650 shipments will be handled by the couriers covering approximately 5.1 million miles, in support of this activity.	<u>FY 1998:</u> It is estimated that 700 shipments will be handled by the couriers, covering approximately 6.1 million miles, in support of this activity.
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FUNDING LEVELS:

\$27,325	361 FTEs	\$29,683	355 FTEs	\$30,971	355 FTEs
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Program Direction

WORKING CAPITAL FUND, established in FY 1997 and authorized by the Department of Energy Organization Act, is a financial management approach for improving the Department's financing and delivery of a range of common administrative services. These activities include: telephones; automated office support systems hardware, software, and training; building occupancy; supplies; copiers; postage; printing and graphics; contract audits, and closeout costs.

PROGRAM GOALS AND ONGOING RESPONSIBILITIES as stated by Departmental Administration:

- Ensure that program mission budgets include a fair allocation of the costs of common administrative services.
- Provide an accurate full-cost budget for programs and activities, including indirect costs.
- Improve the efficiency of administrative services by providing managers with the opportunity and responsibility to make choices on the amount, priority, and, where possible, the source of administrative services used by their programs.

CHANGE FROM FY 1997:

Increased funding reflects escalation of Departmental Administration's assessment of Defense Programs historical expenditures for categories contained in the Working Capital Fund and the addition of cross-servicing expenses for payroll services and related personnel expenses to the Working Capital Fund. In FY 1998, it is planned that the Department's payroll processing activities will be performed by another Federal agency. Therefore, associated payroll processing and personnel costs will be allocated to the programs.

MEASURABLE PERFORMANCE ACTIVITIES:

<u>FY 1996:</u>	<u>FY 1997:</u>	<u>FY 1998:</u>
Provided for miscellaneous administrative-type activities and building costs in support of Defense Programs. Activities included: telephones; automated office support systems hardware, software, and training; building occupancy; supplies; copiers; postage; printing and graphics; contract audits and closeout costs. (Comparability estimate only -- these activities were funded in the Departmental Administrative account).	Responsibility for funding of miscellaneous administrative-type activities and building costs in support of Defense Programs were transferred to Defense Programs; however, management will remain with the Office of Human Resources and Administration.	In addition to miscellaneous administrative-type activities, includes payroll processing and related personnel costs.

FUNDING LEVELS:

\$6,612	\$6,540	\$7,000
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WORKING CAPITAL FUND

Program Direction

LOS ALAMOS COMMUNITY ASSISTANCE PROGRAM provides assistance payments to the Los Alamos County and the Los Alamos School Board to compensate for the lack of an industrial or commercial tax base for the county. The current contracts with the Los Alamos County municipalities and the Los Alamos County School Board expired June 30, 1996. By authority of Public Law 104-106, FY 1996 National Defense Authorization Act, dated February 10, 1996, assistance payments are authorized to continue through June 30, 1997. A report and plan describing the actions required to eliminate the need for further assistance for the school board or the County, including a proposal for legislative action, was submitted pursuant to Section 3161 of H.R. 104-450, Conference Report to Accompany the National Defense Authorization Act for FY 1996. In accordance with S.R. 104-320, in FY 1997 payments under existing contracts which expire June 30, 1997, will be the last payments under the Atomic Energy Act of 1955 and a final settlement payment to the County of Los Alamos, New Mexico was provided. Beginning in FY 1998, the recommendations described in the Reports to Congress Concerning Assistance Payments for the County and School Board of Los Alamos, New Mexico, will be carried out.

PROGRAM GOALS AND ONGOING RESPONSIBILITIES:

- Provide assistance according to agreements negotiated under Public Law 94-187, as described below, the Atomic Energy Community Act of 1955, as amended.
- Provide assistance according to recommendations in the Reports to Congress dated June 1996.
- Distribution of funding is as follows:

	<u>FY 1996</u>	<u>FY 1997</u>	<u>FY1998</u>
Civic Activities	\$ 30	\$ 30	\$ 0
Los Alamos County Assistance Payments to:			
Municipalities	2,839	25,439	250
Schools	<u>8,421</u>	<u>8,421</u>	<u>9,000</u>
	\$ 11,290	\$ 33,890	\$ 9,250

CHANGE FROM FY 1997:

Decrease attributable to final payment to the Los Alamos County in FY 1997 of \$22.6 million.

MEASURABLE PERFORMANCE ACTIVITIES:

<u>FY 1996:</u> Provide assistance payments to the Los Alamos County and the Los Alamos School Board to compensate for the lack of an industrial or commercial tax base for the county.	<u>FY 1997:</u> End annual financial assistance payments to the County on June 30, 1997, expiration of the current contract. In addition to the annual assistance at the current level for FY 1997, provide a one-time payment of \$22.6 million to the County. The FY 1997 payment to the school board under its existing contract with DOE shall be the last such payment under the Atomic Energy Community Act of 1955.	<u>FY 1998:</u> Carry out the recommendations in the reports to Congress on assistance payments. Provide \$250,000 to the County of Los Alamos in lieu of taxes under section 168 of the Atomic Energy Act of 1954. Provide \$4 million to the school board to mitigate cost of living differences as they may affect the Board's ability to attract and retain qualified teachers and staff. Assist in the creation of an initial endowment of a private, not-for-profit foundation to address educational enrichment needs at Los Alamos and in surrounding school districts. The endowment will be provided with up to \$5 million per year for up to five years.
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FUNDING LEVELS:

\$ 11,290	\$ 33,890	\$9,250
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LOS ALAMOS COMMUNITY ASSISTANCE PROGRAM

Weapons Program Direction
Capital Equipment, General Plant Projects, & Construction Project Costs
Detail and Crosscut Dollars in Thousands

	Fiscal Year			
	1996	1997	1998	1999
OPERATIONS & MAINTENANCE				
Capital Equipment				
Basic	<u>\$ 387</u>	<u>\$ 357</u>	<u>\$ 357</u>	<u>TBD</u>
Total, Capital Equipment	\$ 387	\$ 357	\$ 357	TBD

Program Performance Summary
(\$ in thousands)

Support Services	FY 1996	FY 1997	FY 1998	FY 98/97 Change
Technical Support Services				
Feasibility of Design Considerations	\$400	\$400	\$400	\$0
Economic and Environmental and Environmental Analysis	\$8,865	\$8,030	\$7,340	(\$690)
Security Investigation/Communications ES&H Support	\$16,185	\$9,508	\$11,780	\$2,272
Trade-off Analysis	\$1,054	\$945	\$855	(\$90)
Systems Review and Reliability Analysis	\$8,790	\$5,511	\$6,483	\$972
Surveys and Reviews	\$11,414	\$7,616	\$8,543	\$927
Subtotal	\$46,708	\$32,010	\$35,401	\$3,391
Management Support Services				
Management Studies	\$4,778	\$4,032	\$4,110	\$78
Training and Education	\$480	\$430	\$390	(\$40)
ADP Support	\$11,335	\$9,909	\$9,691	(\$218)
General Administration	\$7,705	\$6,857	\$6,102	(\$755)
Subtotal	\$24,298	\$21,228	\$20,293	(\$935)
TOTAL Support Services	\$71,006	\$53,238	\$55,694	\$2,456

Other Related Expenses	FY 1996	FY 1997	FY 1998	FY 98/97 Change
Training	\$3,941	\$4,941	\$4,392	(\$549)
Working Capital Fund	\$6,612	\$6,540	\$7,000	\$460
Printing and Reproduction	\$381	\$446	\$393	(\$53)
Rental Space	\$2,264	\$2,492	\$1,310	(\$1,182)
Software Procurement/Maintenance Activities/Capital Acquisitions	\$6,010	\$6,795	\$5,975	(\$820)
Other	\$67,696	\$88,436	\$62,174	(\$26,262)
Total Obligational Authority	\$86,904	\$109,650	\$81,244	(\$28,406)
Use of Prior Year Balances				
Total Budget Authority	\$86,904	\$109,650	\$81,244	(\$28,406)